HITACHI

PA | No. 0091

TV Models: 27CX22B 501
27CX22B 511
27CX22B 521
27CX31B 501
27CX31B 511
27CX31B 521

SERVICE MANUAL

NTSC | GX CHASSIS

R/C: CLU-418U2
CLU-4110U

CAUTION: Before servicing this chassis, it is important that the service technician read the "Safety Precautions" and "Product Safety Notices" in this Service Manual.

This television receiver will display television Closed Captioning (CC) or ( ) in accordance with paragraph 15.119 of the FCC rules)

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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

SOLID STATE COLOR TELEVISION

JULY 1997 **HHEA - MANUFACTURING DIVISION**

PRODUCT SAFETY SERVICING GUIDELINES FOR AUDIO-VIDEO PRODUCTS

CAUTION: Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to your being liable for any resulting property damage or user injury.

Service work should be performed only after you are thoroughly familiar with all of the following safety checks and servicing guidelines. To do otherwise increases the risk of potential hazards and injury to the user.

While servicing, use an isolation transformer for protection from AC line shock.

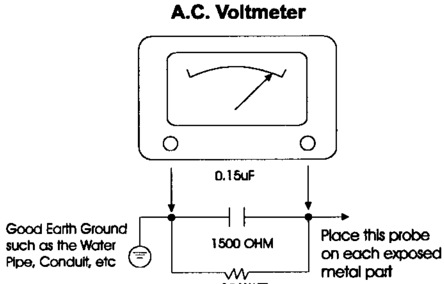
SAFETY CHECKS

After the original service problem has been corrected, make a check of the following:

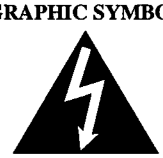
FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on modules transported to and from the repair shop.
2. Never release a repair unless all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary. Follow the original layout, lead length, and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. All critical components such as fuses, flameproof resistors, capacitors, etc. must be replaced with exact factory types. Do not use replacement components other than those specified or make unauthorized circuit modifications.
7. After re-assembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure the set is safe to operate without danger of electrical shock. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST. Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by a .15 mfd 150V AC type capacitor between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15 mfd capacitor. Reverse the AC plug (if non-polarized) and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

A.C. Voltmeter



GRAPHIC SYMBOLS



THE LIGHTNING FLASH WITH ARROWHEAD SYMBOL WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF NONINSULATED "DANGEROUS VOLTAGE" THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.



THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO IMPORTANT SAFETY INFORMATION IN THE SERVICE LITERATURE.

X-RADIATION

1. Be sure procedures and instructions to all service personnel cover the subject of x-radiation. The only potential source of x-rays in current TV receivers is the picture tube. However, this tube does not emit x-rays when the HV is at the factory-specified level. The proper value is also given in the applicable schematic. Operation at higher voltages may cause a failure of the picture tube or high voltage supply and, under certain circumstances, may produce radiation in excess of desirable levels.
2. Only factory-specified CRT anode connectors must be used. The degaussing shield also serves as an x-ray shield in color sets. Always re-install them.
3. It is essential that the service personnel have available an accurate and reliable high voltage meter. The calibration of the meter should be checked periodically against a reference standard, such as the one available at your distributor.
4. When the high-voltage circuitry is operating properly, there is no possibility of an x-radiation problem. Every time a color chassis is serviced, the brightness should be run up and down while monitoring the high voltage with a meter, to be certain that the high voltage does not exceed the specified value and that it is regulating correctly. We suggest that you and your service organization review test procedures so that voltage regulation is always checked as a standard servicing procedure, and that the high voltage reading be recorded on each customer's invoice.
5. When troubleshooting and making test measurements in a product with a problem of excessively high voltage, avoid being unnecessarily close to the picture tube and the high voltage power supply. Do not operate the product longer than necessary to locate the cause of excessive voltage.
6. Refer to HV, B+, and shutdown adjustment procedures described in the appropriate schematics and diagrams (where used).

IMPLOSION

1. All direct view picture tubes are equipped with an integral implosion protection system; take care to avoid damage during installation.
2. Use only the recommended factory replacement tubes.

TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct rear venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate air flow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using a cart or stand that has not been listed by Underwriters Laboratories, Inc. for use with its specific model of television receiver or generically approved for use with TVs of the same or larger screen size.
8. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

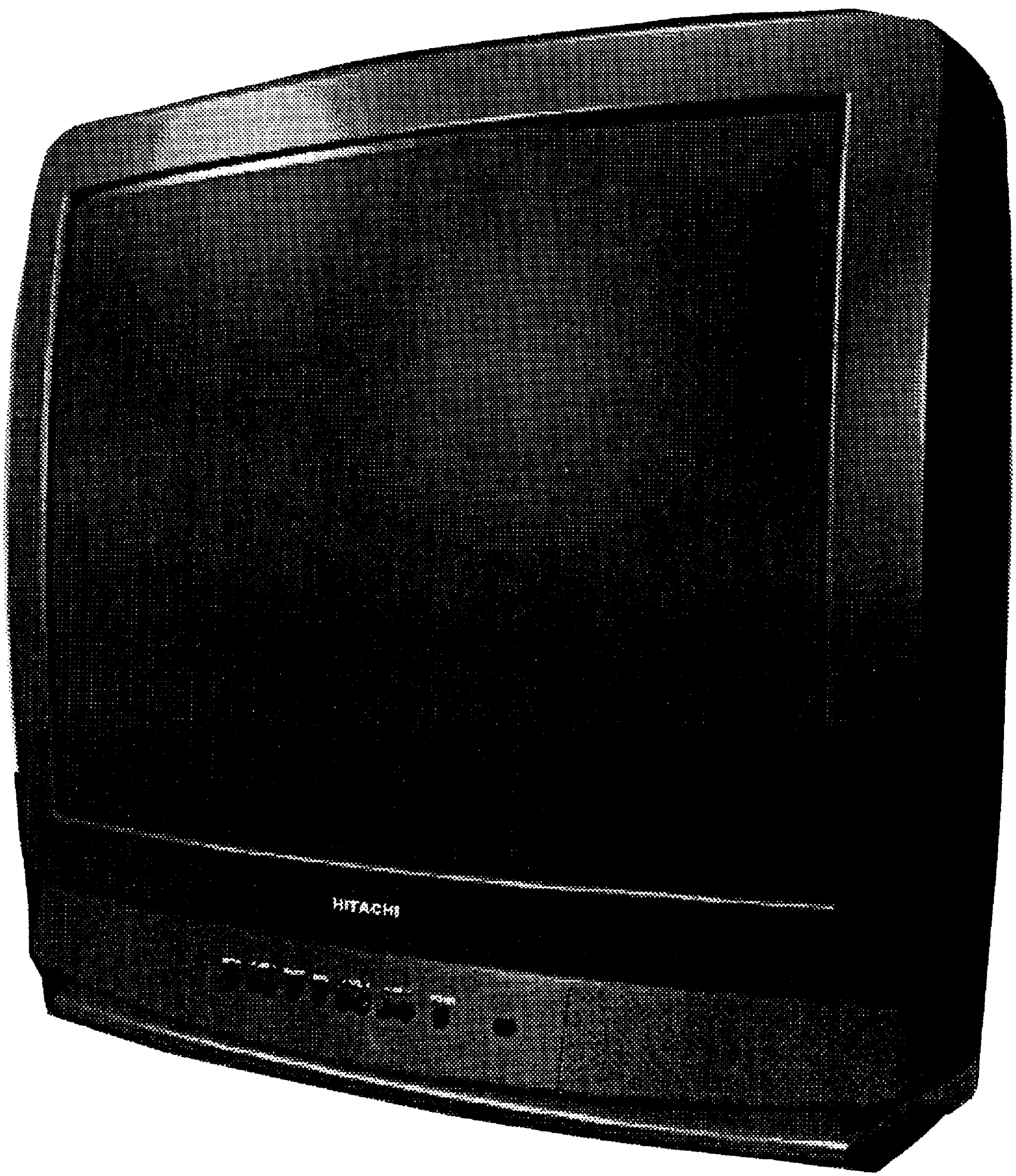
GX CHASSIS

INTRODUCTION

The new GX series chassis has been developed for 27" screen size stereo models. Additional plug-in boards will be added to the chassis to accommodate the different features: Stereo, Mono, PIP, etc.

The new GX series chassis features four I^2C compatible ICs for all signal, sync and sweep processing. ICX2200 handles all of the audio/video, sync, and sweep drive processing. IC6000 is the microprocessor and IC6001 is the memory. The keyboard and IR detector are tied directly to IC6000. IC2100 handles the vertical sweep.

ICX3431 is in the power supply. This is a switching type supply powered by the bridge rectifier circuit. At turn on, voltages for the vertical and video output circuit are derived from the sweep circuit.



SERVICE MENU

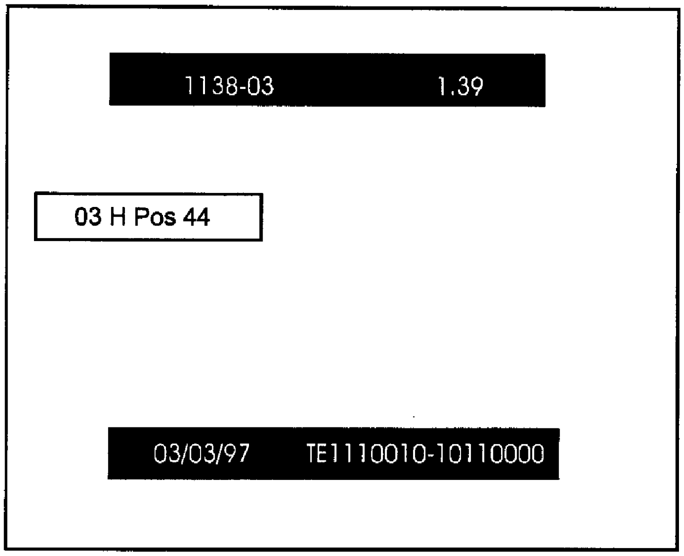


Figure 1

Access the Service Menu by using either the remote control or the keyboard on the front of the set.

With Remote: Press and hold **MENU** until the User Menu display disappears, then press 9, 8, 7, 6, and **ENTER**. This will bring up the 03 HPos item of the Service Menu (see Figure 1).

With Keyboard: Press and hold **MENU** until the User Menu display disappears. Immediately press the Adj. Right and Channel Up keys simultaneously. To exit the Service Menu, press **ENTER**.

NOTE

Entry into and exit from the Service Menu will automatically unblock all child lock control.

See Figure 1. The black bar at the top indicates the part number and version of the software in the set. The date on the left side of the black bar at the bottom indicates the date the module went through the factory. At the right is the date indicating when the module was tested.

The Service Menu will always come up on the third item H Pos. Use **Select** to toggle through all of the adjustments.

00 F MODE: (Factory Mode) Use Select to select item #00, the first item in the Service Menu, in Factory Mode. This item is used by the factory when the modules are being tested. In the field, this item should always be left "Off." Zero is "Off!"

When Factory Mode is off, you'll only be able to view only the first seven items in the Service Menu. When Factory Mode is set to 1, you can view the 37 other menu items. They will appear on the screen one at a time at the top left of the screen. The black bars at the top and bottom of the screen, as shown in Figure 1, will not appear.

NOTE

A quick way to determine if Factory Mode is "On" is if a pair of dashes appears at the top of the Customer Setup Menu.

Other unusual things to look for when Factory Mode is "On" are, for example, the AC power-on feature is always enabled regardless of the setting of "AC On" in the Service Menu. The set automatically turns on when AC is applied.

In addition, when Factory Mode is "On," you can access the Service Menu by simultaneously pressing the Right Adj. and Channel Up buttons on the front of the set. Otherwise, you'll have to use the remote to reenter the Service Menu to turn off Factory Mode.

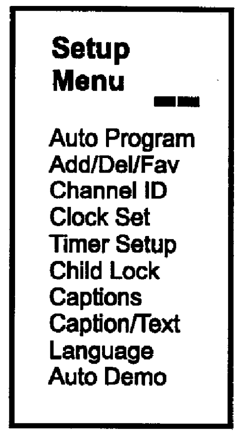


Figure 2

NOTE

You can also turn off Factory Mode by adjusting the setting of the clock or by running Auto Program in the customer Setup Menu.

01 Pre Px: Stores customer menu adjustments in the nonvolatile memory of the EAROM. Settings for Contrast, Brightness, Color, Tint, and Color Temperature are stored this way. 0 is custom and 1 is preset stored.

02 VPos: Moves on-screen display vertically. Range 0 to 31.

03 HPos: Moves on-screen display horizontally. Range 0 to 75.

04 LEVEL: Two settings: 0 and 1. 0 is private (Hitachi) label 1 is other.

05 Band: Eight positions: 0 is broadcast fixed, 1 is CATV afc search, 2 is HRC afc search, 3 is ICC afc search, 4 is Broadcast afc search, 5 is CATV fixed, 6 is HRC fixed, 7 is ICC fixed.

06 AC On: Two positions: 0 is off and 1 is AC on. In the On position, the set will turn on when AC power is applied.

07 C Phas: (Caption Phase) Determines captioning phase. Range 0 to 254.

08 C Srch: (Caption Search) Range 0 to 1.

09 C Line: (Caption Line) Range 0 to 32.

10 RF Bpf: (RF bandpass Filter) Range 0 to 1.

11 3.58: 3.58 Mhz trap. Range 0 to 1.

12 RF Brt: (RF Brightness) Sets adjustment range of the customer control for brightness in the RF mode. Range 0 to 63.

13 Ax Brt: (Aux Brightness) Sets adjustment range of the customer control for brightness in the AUX mode. Range 0 to 63.

14 MaxCon: (Max Contrast) Sets adjustment range of the customer control for contrast. Range 0 to 63.

15 V Phase: (Vertical Phase) Shifts picture vertically. Range 0 to 7.

16 HPhase: (Horizontal Phase) Shifts picture horizontally. Range 0 to 31.

17 AudLvl: (Audio Level) Sets gain for the MTS Stereo. Range 0 to 63.

18 AudAdj: (Sound Balance) Range 0 to 63.

19 RF AGC: Range from 0 to 63.

20 H AFC: Horizontal AFC 0= AFC 2 Normal, 1= AFC 2x3.

21 Wh Comp: (White Compression) Two settings: 0 and 1.

22 60 HzSw: (60 Hz Switched) 0=Normal, 1=H/V Locked, 2=Ideal, 3=V Locked, Range 0 to 3.

23 PifVco: (PIF Voltage Controlled Oscillator) Range 0 to 127.

NOTE

Items 24 -28 are for B&W tracking and change depending on the Color Temp setting in the Video Menu.

24 R Cut (Red Cutoff) Range 0 to 254.

25 G Cut: (Green Cutoff) Range 0 to 254.

26 B Cut: (Blue Cutoff) Range 0 to 254.

27 G DVR: (Green gain) Range 0 to 254.

28 B DVR: (Blue gain) Range 0 to 254.

PIP Parameters

29 PIP Ras: (PIP Raster Register) Range 0 to 255.

30 PIP Sw: (Pip switch delay) Centers PIP Border and PIP picture in the Horizontal Direction. Range is 0 to 15.

31 PIP Lud: (PIP Luminance Delay) Matches Lum and Chroma of the inset picture. Range 0 to 7.

32 PIP1: Range 0 to 127.

33 PIPX2: Range 0 to 127.

34 PIPY1: Range 0 to 127.

35 PIPY2: Range 0 to 127.

36 PIPTnt: Range 0 to 63.

Audio Parameters

The following items are factory aligned. See Bar Code label for correct settings.

37 Spectr: Range 0 to 15.

38 WideBa: (Stereo Voltage Controlled Oscillator) Range 0 to 63.

39 SapVco: (Second Audio Program Voltage Controlled) Range 0 to 63.

40 SapLpf: (Second Audio Program Low Pass Filter) Set to 0 (not adjustable).

41 StLpf: (Stereo Low Pass Filter) Set to 0 (not adjustable).

42 Spectr: (High Frequency Separation) Set to 0 (not adjustable).

43 WideBa: (Wide Band Low Frequency Separation) Set to 0 (not adjustable).

FACTORY RECOMMENDED SETTINGS

GENERAL SETTINGS (Green)

ITEM	RANGE	TYPICAL SETTING	DESCRIPTION
00 F Mode	0 - 1	0	Factory mode 0 is Off
01 Pre Px	0 - 1	1	0 is Custom, 1 is preset
02 V Pos	0 - 31	10	Moves the On-Screen Displays Vertically
03 H Pos	0 - 75	38	Moves the On-Screen Displays Horizontally
04 Level	0 - 2	0	1 is other, 0 is P Lbl (Hitachi)
05 Band	0 - 7	0	Broadcast fixed
06 AC On	0 - 1	0	1 is On, 0 is Off

TECHNICAL SETTINGS (Black)

07 C.Phas	0 - 254	80	Caption Phase
08 C.Srch	0 - 1	0	0 is Off, 1 is On
09 C.Line	0 - 32	17	Caption Line
10 Rf Bpf	0 - 1	0	RF Bandpass Filter 1 is On, 0 is Off
11 3.58T	0 - 1	1	3.58 Mhz Trap
12 RF Brt	0 - 63	35	RF Sub brightness
13 AxBrt	0 - 63	35	AUX Sub brightness
14 MaxCon	0 - 63	63	Maximum Contrast
15 VPhase	0 - 7	0	Vertical Phase
16 HPhase	0 - 31	19	Horizontal Phase
17 AudLvl	0 - 63	44	Sound Attenuation (Gain for LCS, MTS audio)
18 Aud Adj	0 - 63	63	Sound Balance
19 RF Agc	0 - 63	35	RF AGC
20 H Afc	0 - 1	1	H Afc 0 is Off, 1 is On
21 Wh Comp	0 - 1	0	White Compression 0 is Off, 1 is On
22 60HzSw	0 - 3	2	60 Hz Switch
23 PifVco	0 - 127	46	PIF Voltage Controlled Oscillator
24 R Cut	0 - 254	13	Red Cutoff
25 G Cut	0 - 254	4	Green Cutoff
26 B Cut	0 - 254	6	Blue Cutoff
27 G Dvr	0 - 254	90	Green Gain
28 B Dvr	0 - 254	81	Blue Gain

PIP SETTINGS (White)

29 PipRas	0 - 254	69	PIP Raster
30 Pip Sw	0 - 15	11	PIP Switch Delay
31 PipLuD	0 - 7	3	PIP Luma Delay
32 PipX1	0 - 127	7	X position for PIP Left position
33 PipX2	0 - 127	61	X position for PIP Right position
34 PipY1	0 - 127	5	Y position for PIP Upper position
35 PipY2	0 - 127	42	Y position for PIP Lower position
36 PipTnt	0 - 63	31	PIP tint adjust. This value allows the customer control to be centered for "neutral" tint.

AUDIO SETTINGS (Yellow)

37 InLev	0 - 15	9	Input Level
38 StVco	0 - 63	29	Stereo VCO
39 SapVco	0 - 15	3	SAP VCO
40 SapLpf	0 - 15	9	SAP LP Filter
41 StLpf	0 - 63	26	Stereo LP Filter
42 Spectr	0 - 63	30	Spectral High Freq. Separation
43 WideBa	0 - 63	30	Wide band Low Freq. Separation

POWER SUPPLY

Standby Voltages

+150 DC at RX3404

+130 DC at CX3420

+15 DC at emitter of Q3404

+5V DC at pin 3 of IC3442

Power On

Keyboard input at IC6000 pin 19 and 20

IR input at IC6000 pin 2

Power On output at IC6000 pin 52

Q3402 power supply switching transistor

Switched Voltages

+9 volts DC at pin 3 of IC3441

+15 volts DC at collector of Q3404

Sweep Derived Voltages

+23 volts DC at the junction of CX3268 and RX3242

+35 volts DC at CX327

+245 volts DC at junction of CX3296 and RX3217

CRT Filament at pins 1 and 2 connector 2F5

VIDEO PROCESSOR ICX2200

Key operating Signals

Composite Video out to pin 41

Composite Audio out at pin 2

Horizontal Drive at pin 32

Vertical Drive at pin 24

Video output Blue at 2C5 pin 3

Video output Green at 2C5 pin 2

Video output Red at 2C5 pin 1

B+ 9 volts – pins 9, 23, 33, 46 and 48

Serial Data, Serial Clock pins 30, 31

VERTICAL CIRCUIT

Vertical drive pulse pin 3

+23 volts pins 2,10, and 11

Vertical out pin 1

Poor Linearity check C2114, C2115

HORIZONTAL CIRCUIT

Horizontal drive to base of Q3202 predriver

Driver transformer output base of Q3208

Shutdown voltage cathode D2251

Scan derived voltages +23, +35 and +245 volts

MICROPROCESSOR IC6000

IR in on pin 2

Power Ctl pin 52

+5 volts pins 22, 39

Clock Xtal pins 36, 37

Reset pin 35

H Sync pin 28, V Sync pin 29

R, G, B out pins 24, 25, 26

SERVICE ADJUSTMENTS (Mechanical)

1. Vertical Size-R2133 Adjust R2133 for about 1/2" overscan at top and bottom of picture.
2. Horizontal Width (Some Models) Adjust R3249 for 1/2" overscan on both sides of the picture.

G2 ADJUST

Use the following procedure when re-setting G-2:

1. Set brightness and contrast in the Video Menu to mid-range.
2. Set color level to minimum, and tint to midrange.
3. Connect output of an NTSC generator to antenna input on receiver.
4. Select a color bar signal and turn color off. Adjust G2 control so that bar patterns range from completely black to a "not overdriven" (not saturated) white. There should be a distinct difference between black and white bars. Different shades of gray should be distinguishable if the G2 is set correctly.
5. Return the color level control to its normal setting. Leave generator connected if RGB cutoff is to be adjusted.

ADJUSTMENT OF RGB CUTOFF

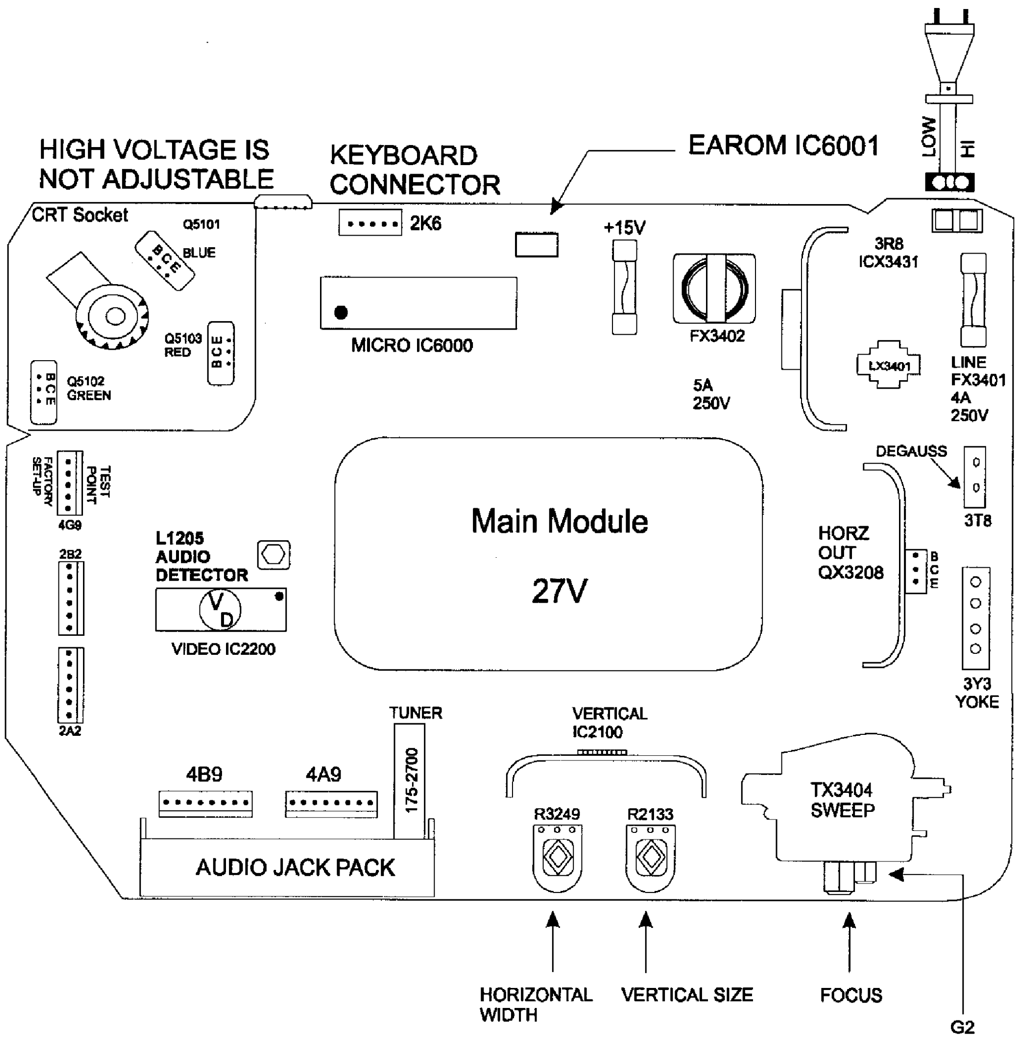
G2 control must be adjusted before RGB drive.

1. If main module or CRT has been replaced, select default settings for drive and cutoff for RGB as listed in Service Menu.
2. Set color level to minimum and tint to mid range.
3. Connect output of an NTSC generator to antenna input of receiver. Set generator to a white raster signals, chroma off.
4. Enter Service Menu to gain access to cutoff adjustments. (Factory Mode item 00 must be set to 1 to gain access to these adjustments).
5. Set items 24 R Cut, 25 G Cut, and 26 B Cut to 0. Set B and G DRV to the recommended settings (page 4 items 27 and 28).
6. Carefully observe which color is predominant on CRT. **Do not** adjust cutoff predominant color from 0 setting. Adjust other two cutoff controls for best white screen display.
7. Set generator to a color bar pattern and turn chroma off. Check that set displays a good gray scale from black to white. If black level is too high, readjust G2 slightly.
8. Return the color level control to normal.

IMPORTANT

When replacing a main module, it should be checked for correct feature level of 0.

Change the feature by entering the Service Menu and selecting item 04 level. Use the adjust button to change the level.



IF AND AUDIO ALIGNMENT PROCEDURE

VIDEO DETECTOR

If there is no viewable picture, enter Service Menu and check default settings for the following items:

Item 05 Band should be set to 0.

Item 19 RFAgc should be set to 44.

Item 23 PIFVco should be set to 48.

With a high impedance DC meter, measure VDC at pin 44 on ICX2200 or on R1219 with good standard signals such as off-air. Adjust item 23 PIFVco for VDC = 2.5V.

NOTE

This is also the AFC Crossover point.

AGC DELAY

With a strong noise-free antenna signal, adjust Service Menu item 19 RFAgc setting lower until signal looks noisier, increase setting for a noise free picture.

NOTE

If you adjust above setting 40, the tuner input will overload under certain conditions, causing other beats in the picture.

A more accurate method is to apply a channel 6 signal at 750μ V 75 ohms to the antenna. Then adjust Service Menu item 19 RF Agc until tuner Agc drops 1 VDC from typical. Voltage can be measured at (+) terminal of capacitor C6028.

AUDIO DETECTOR

If no audio is present, enter the Service menu and check default setting for the following items:

Item 17 AudLvl should be set to 44.

Item 18 AudAdj should be set to 63. This item is not to be field adjusted.

With a high impedance DC meter, measure VDC on ICX2200 Pin 54 or (+) terminal of C1211 with a good standard signal such as off-air. Adjust L1205 for 4.0 VDC.

STEREO LEVEL ADJUST

This adjustment can be made with jack pack removed or attached to the chassis.

Service menu item 17 AudLvl should not be changed unless ICX2200 has been replaced on the main chassis. If an MTS jack pack is changed, the new coefficients (bar code data) must be entered in the Service menu for proper stereo alignment.

JACK PACK REMOVED

1. Attach a high impedance AC meter with a 47k load to pin 3 and ground lead to pin 4 of 4A9.
2. Ground pin 7 of 4A9.
3. Ground pin 2 of 4B9 through a 10k resistor.
4. Interrupt main AC power to reset microprocessor.
5. Apply an RF signal with good video and audio at 400 Hz and 100% modulation.
6. Go to Service Menu item 17 AudLvl and adjust setting for 490 to 500 MVAC.

JACK PACK ATTACHED

1. Attach a high impedance AC meter to W1611 and ground lead to W1603 on top of jackpack. Ground jumper W53 on main chassis to reduce high frequency noise.
2. Interrupt main AC power to reset microprocessor.
3. Apply an RF signal with good video and audio at 400Hz and 100% modulation.
4. Go to Service Menu item 17 AudLvl and adjust setting for 490 to 500 MVAC.

MTS STEREO ALIGNMENT COEFFICIENTS

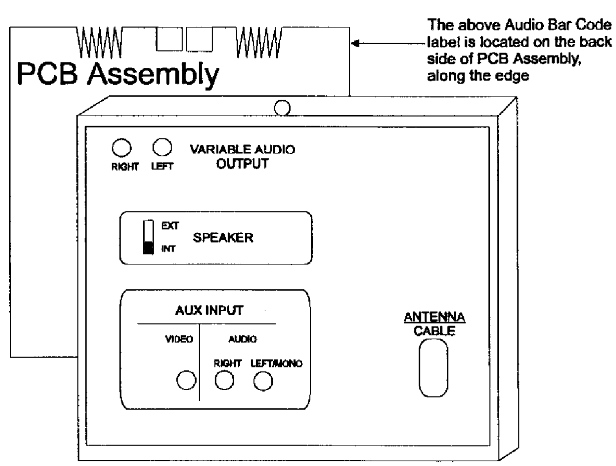
Enter coefficients (bar code data) attached to the jack pack at this item. Enter these settings in their appropriate locations in the Service menu items 37 - 43 (starting with the left-most two digits for item 37).

TYPICAL JACK PACK BAR CODE LABEL
LOCATED ON THE JACK PACK ASSEMBLY PCB

37 38 39 40 41 42 43 - Service Menu Item

09 29 03 09 26 30 30 - Coefficients or Settings

1SYBC —Serial Number



PURITY & CONVERGENCE SET-UP PROCEDURE FOR COTY CRTs

PRELIMINARY SET-UP

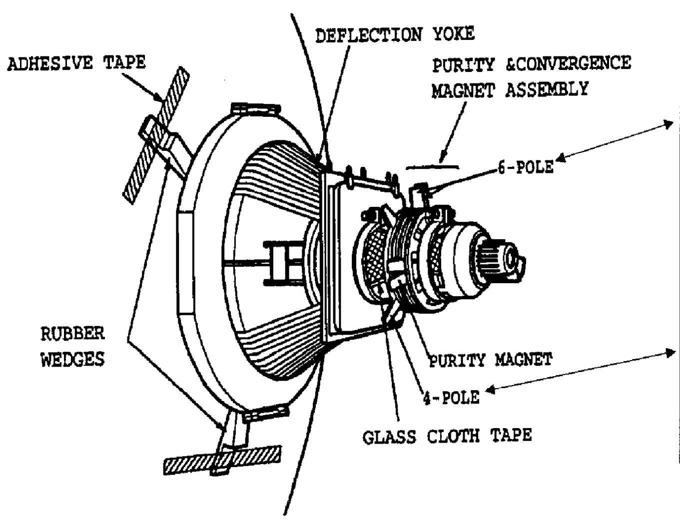
1. Allow the receiver to warm up for 15 to 20 minutes.
2. Degauss the receiver.
3. Connect a crosshatch generator to the receiver and "rough in" the static (center) convergence. Follow the Convergence Procedure.
4. Adjust for best focus.

PURITY ADJUSTMENT

1. Purity tab positioning:
   Set the 2 pole purity tabs together in the 3 or 9 o'clock positions and the 4 and 6 pole purity tabs together in the 12 or 6 o'clock positions.
2. Move yoke to the maximum forward funnel position.
3. Switch the crosshatch generator to a red field.
4. Pull the yoke toward the rear of the CRT neck until the centered pure red raster is displayed.
5. If the red raster is not displayed as a pure red field, adjust the 2 pole purity tabs until a pure field is obtained.
6. Check for proper yoke tilt setting.

CONVERGENCE ADJUSTMENT

1. Release locking assembly.
2. Connect crosshatch generator to the receiver and adjust static (center) convergence as follows:
   a. Adjust the 4 pole static control by moving the two tabs separately to converge the red and blue lines horizontally. Move the two tabs together around the neck of the CRT (in a 45° arc) from the top dead center position to converge the red and blue lines vertically.
   b. After the 4 pole control has been adjusted to superimpose the red and blue lines on top of one another, use the 6 pole static adjustment to place the converged red and blue lines over the green line. Move the two tabs together around the neck of the CRT (in a 30° arc) from the top dead center position to move the lines vertically. Adjusting the two tabs separately will move the converged beam to the left or right. Using a crosshatch generator capable of producing individual fields, adjust generator to produce a red field. Use the purity tabs to center a red stripe.



CRT Ring Location Purity
Adjust Tabs Beam Movement
for Convergence

Ring Pairs	Rotation direction of both tabs	Movement of Red and Blue beams
6 Pole Convergence R&B over G	Opposite	←(B) ←(R) OR (B)→ (R)→
	Same	(B)↑ (R)↑ OR (B)↓ (R)↓
4 Pole Convergence R over B	Opposite	←(B) (R)→ OR (B)→ ←(R)
	Same	(B)↑ (R)↓ OR (B)↓ (R)↑

VERTICAL - TILT - WEDGE ADJUSTMENT

Converge the vertical lines at 6 and 12 o'clock by vertically tilting the yoke and inserting a wedge at the top of the yoke until it is firmly seated between the CRT glass and the horizontal coils.

HORIZONTAL - TILT WEDGE ADJUSTMENT

Converge the vertical line at 3 o'clock and 9 o'clock by horizontally tilting the yoke and inserting a wedge.

First, at 4 or 8 o'clock, whichever has a larger space, insert a second wedge until it is firmly seated between the CRT glass and yoke coils. Then insert the third wedge in the remaining horizontal tilt position until firmly seated between the CRT glass and yoke coils. Convergence at 3 and 9 o'clock should be maintained during this operation.

When the three wedges are firmly installed for acceptable convergence, lock the wedges in place by applying a strip of tape (2.5" long) across the tabs of each wedge, firmly against the CRT glass. The CRT glass surface should be clean and free of dust and other foreign material.

UNUSUAL TILT CASE

There may be some cases of picture tube and yoke that require vertical tilt in the opposite (or up) direction to obtain convergence. In such cases, insert the vertical tilt wedge at the bottom (or 6 o'clock) position. Follow through the horizontal tilt adjustment by using the 2 and 10 o'clock position and secure each wedge with a piece of tape as described above.

IMPROVING CRT CORNER PURITY

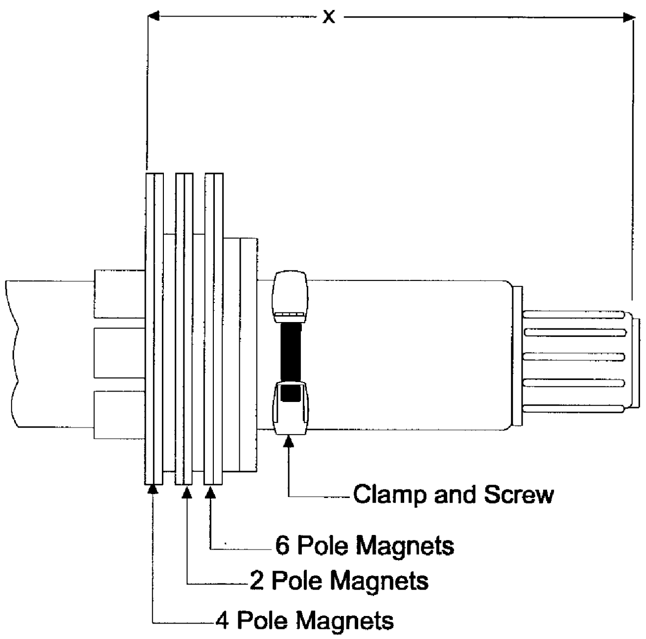
CRTs that display corner purity problems even after following service procedures can be modified with a picture correction kit (P/N 949-50). The purity can be improved by placing a picture correction magnet (included in the kit) on the CRT funnel. Refer to the following modification steps and illustration to place the magnet properly.

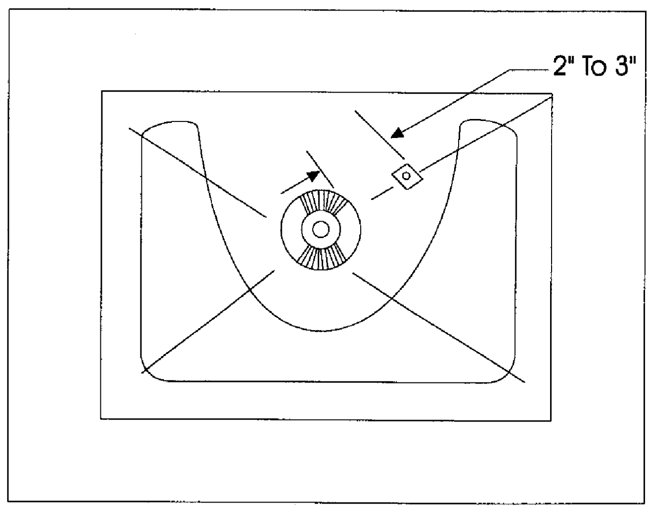
MODIFICATION

1. Place the magnet on the CRT funnel (as shown) in the quadrant exhibiting impurity.
2. Rotate the magnet in place to the position shown for best purity.
3. Place a piece of 1/2" x 2" Fiberglass tape over the magnet to hold it in place.
4. Degauss the CRT once the magnet is in place to insure that the magnet is not over the internal magnet shield.

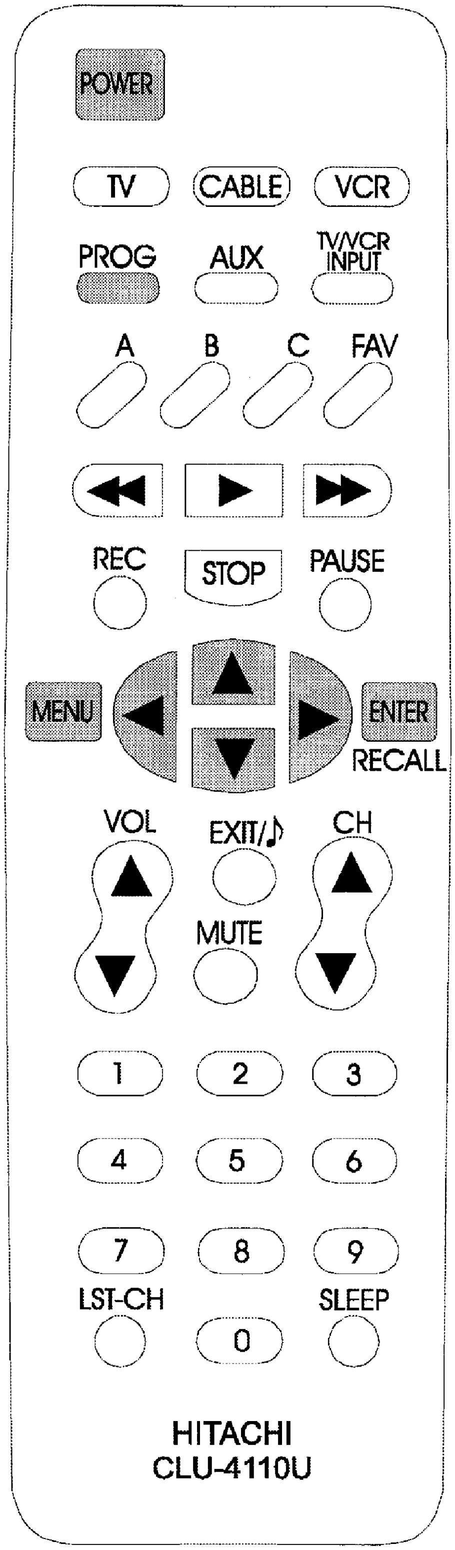
NOTE

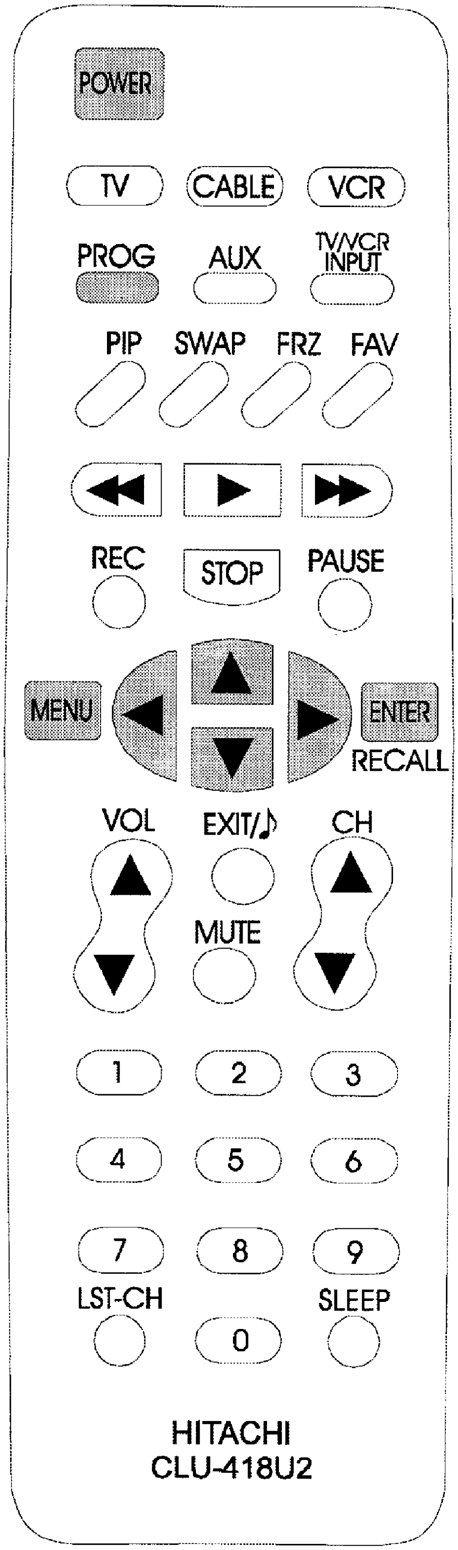
If the magnet is placed over the internal magnet shield, any apparent purity correction will disappear after degaussing. Reposition the correction magnet off the internal shield and degauss again.





REMOTE CONTROL





REMOTE CONTROL

PROGRAMMING YOUR REMOTE

If you're using Hitachi products, the remote is already programmed for the most common codes:
TV = 121 and VCR = 215. For other brands, or if your remote fails to control your Hitachi products, you'll have to program the remote.

1. Make sure the batteries are installed.
2. Press and hold **PRG** key for about 5 seconds, then release the **PRG** key.
3. Press the mode key to be programmed: **TV, CABLE, VCR OR AUX**.
4. Enter 3-digit product code from chart on next page.
5. Press and release **ENTER** to save the code.
6. Point remote at product and press **POWER** to test product operation. If it does not turn on, reprogram remote using a different code.
7. Repeat above steps to program remote for another product.

AUTO FIND OPTION (ALTERNATE PROGRAMMING METHOD)

If you've tried all codes for your product and none operates it, you can use Auto Find to search for the code you need. Follow the steps below for each product you want to program. Please be patient while using this method; the remote may have to search all of the codes shown in the chart on the next page.

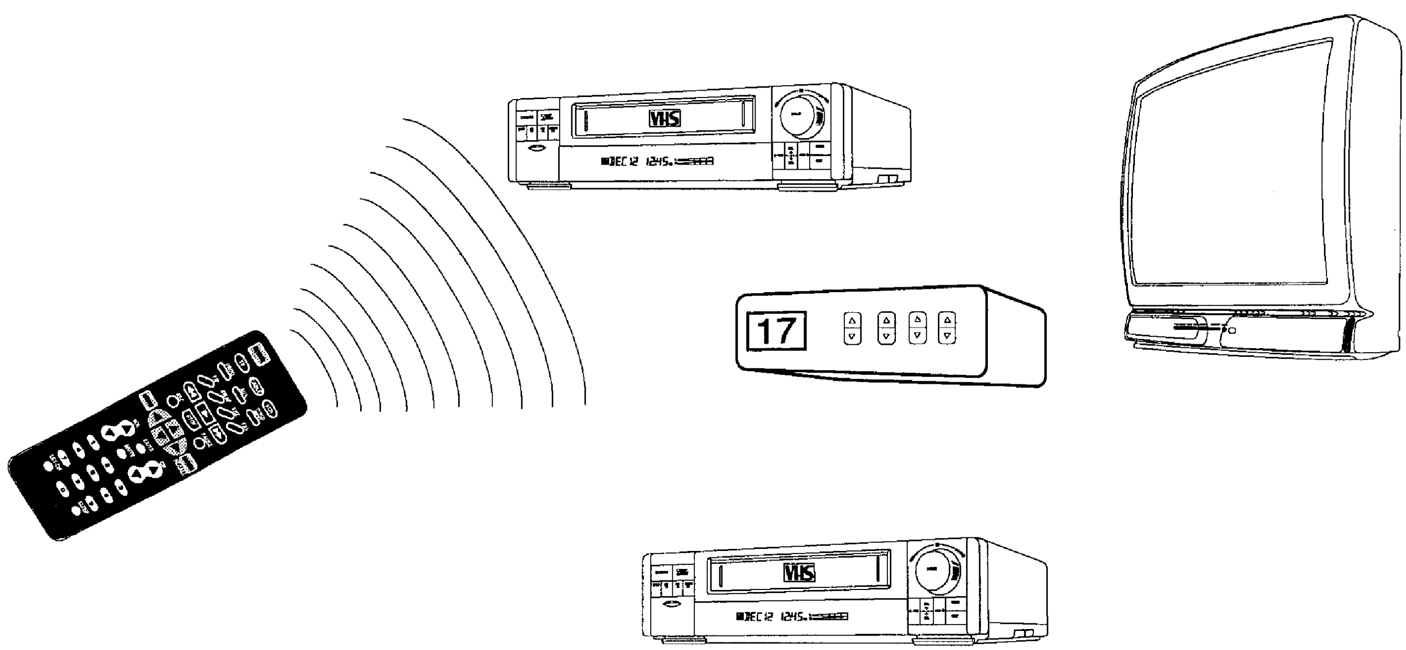
To Auto Find a Code

1. Turn On the product you want to operate.
2. Press and hold **PRG** key for about 5 seconds, then release the **PRG** key.
3. Press the mode key to be programmed: **TV, CABLE, VCR OR AUX**.
4. Enter "0-0-0," then press **ENTER** within two seconds.
5. Point the remote at the product.
6. Press and release **POWER** repeatedly, about once a second, until your product turns Off.
7. Press **ENTER** immediately to save the code.
8. Press **POWER** to turn On your product.
9. Test your product. If the remote fails to operate the functions you use most often, use Auto Find again to search for a better code. (Auto Find resumes its search after the last code that was entered and saved in step 7).If the product you want to control has not turned off, your remote will not work with that product.

NOTE

To cancel Auto Find, press PRG at any time.

Refer to product operating guide for detailed programming information.



OPERATING CODES BY BRAND NAME

TVS

Brand	Codes
Admiral	116, 121, 130, 133
Adventura TV/VCR	154
Akai	104
Amark	103, 146
AOC	104
Bell & Howell	121
Broksonic	131, 136
Candle	139
Centurion	119
Citizen	121, 139
Contec	141
Coronado	103
Crown	103
Curtis Mathes	116, 119, 121
Daewoo	149, 159
Daewoo TV/VCR	148
Daytron	119
Elektra	121
Emerson	103, 104, 123, 124, 131, 136, 145
Emerson TV/VCR	158
Fisher	109, 118
Funai TV/VCR	154
General Electric	106, 107, 114, 116, 117, 161
Goldstar	103, 104, 119, 147
Goldstar TV/VCR	153
Hitachi	102, 103, 121, 129, 163
J.C. Penney	104, 110, 114, 117, 119
JVC	125, 132, 164
KMC	103
KTV	103, 104, 138
Kurazai	121
Lodgenet	121
Logik	121
LXI	133, 137
Magnavox	103, 112, 113, 117, 119, 127, 128, 139, 165
Magnavox TV/VCR	173
Majestic	121
Marantz	104, 120, 155
Megatron	146
Memorex	121
MGA/ Mitsubishi	104, 119, 120, 130, 140, 155
Montgomery Ward	103, 104, 105, 113, 114, 119, 121, 130, 133
NEC	104, 119
Panasonic	106, 107, 160, 166
Panasonic TV/VCR	174
Philco	103, 104, 112, 113, 139
Philips	112, 113
Pioneer	135
Portland	103
ProScan	116, 157, 162, 167
Quasar	106, 107
RCA	104, 116, 126, 157, 161,162,167,168
Realistic	105, 123, 124
Sampo	119
Samsung	103, 119, 134, 141
Sanyo	108, 109, 118
Scott	119, 124
Sears	103, 108, 109,110, 111, 118, 134
Sharp	103, 105, 122, 133, 137, 156, 169
Signature 2000	103, 104, 105, 113, 114, 119, 121, 130, 133
Sony	115, 143, 151, 170
Soundesign	139
Sylvania	112, 113, 117, 119, 127, 128, 139
Symphonic TV/VCR	154
Tatung	106
Teknika	103, 112, 121, 124, 139
Telerent	103, 121
Toshiba	110, 111, 134, 171
XR1000	121
Yorx	119
Zenith	101, 149, 175
Zenith TV/VCR	153, 154, 172

VCRS

Brand	Codes
Admiral	208, 261
Adventura	231
Aiwa	231
Akai	223, 238, 241
Audio Dynamics	202, 218
Bell & Howell	206, 247
Broksonic	221, 226, 250, 255
Canon	214
Citizen	209
Craig	212
Curtis Mathes	214, 259
Daewoo	244, 246, 248, 254
Daytron	236, 246
DBX	202, 218
Emerson	203, 209, 221, 223, 226, 233, 235, 243, 250
Fisher	211, 212, 213, 247
Funai	231
General Electric	214, 216, 220
Goldstar	209
Go Video	256, 262, 263
Hitachi	215, 257
Instant Replay	214, 227
J.C. Penney	214, 215, 218, 227
JVC	202, 224, 225, 258
Kenwood	202
Logik	239
LXI	209, 231
Magnavox	207, 214, 231
Marantz	207, 218
Marta	209
Memorex	206, 212, 214, 231
Mitsubishi	204, 222, 252, 264
Montgomery Ward	208, 214, 216, 219, 231, 249
Multi Tech	239
NEC	202, 218
Orion	250
Panasonic	214, 251, 259
Pentax	215
Philco	207, 214
Philips	207, 214, 227
Pioneer	210, 215
Portland	246
Pro Scan	216, 260
Quasar	214, 259
RCA	215, 216, 220, 227, 240, 242, 249, 260
Realistic	206, 208, 212, 214, 231
Samsung	220, 230, 238
Sansui	239
Sanyo	206, 212, 247
Scott	204, 205, 233, 243
Sears	206, 209,211, 212, 215
Sharp	208, 261
Shintom	239
Signature 2000	208, 214, 216, 219, 231, 249
Sony	217, 232, 237
Sylvania	207, 214, 227
Symphonic	231
Tashiko	209
Tatung	202
Teac	202, 231
Teknika	209, 234
Toshiba	205, 215
XR1000	239
Vector Research	204, 218
Yamaha	202, 218
Zenith	201, 224, 225, 229, 237

CABLE/SATELLITE

Brand	Codes
Allegro	358, 362
Allegro A/B Switch	361
Gemini	305, 331, 338
General Electric	367
General Instrument	304, 305, 306, 307, 308, 309, 310, 318
Hamlin	302, 303, 345, 365, 366
Jerrold	304, 307, 308, 309, 310, 318, 360, 363
Kale Vision	335
Macom	314, 321
Magnavox	334
NSC	335, 339, 368, 369, 370
Oak	311, 332, 342
Panasonic	313, 320
Paragon	333
Philips	347, 350, 352, 354, 355
Pioneer	315, 343
RCA DSS	373
Regency	329
Samsung	335
Scientific Atlanta	316, 323, 336, 364
Sprucer	313
Standard Comp	335
Stargate	379
Texscan	339, 356, 371
Tocom	317, 318, 346
Unika	348, 362
United Satellite	344
Universal	358, 362
Vid Tech	340
Video Way	349
Viewstar	354, 355, 372
Zenith	301, 353, 374
Zenith Satellite	312, 328, 330, 351, 378

VIDEO DISC PLAYERS

Brand	Codes
Pioneer	402, 403
Sanyo	401
Sony	404
Zenith	401

AUDIO CD PLAYERS

Brand	Codes
Akai	409, 424
Crown	410
Denon	411
Fisher	412, 438
Goldstar	460
Harman/Kardon	413
JVC	415
Kenwood	412, 416, 417, 441
Magnavox	421, 422, 433, 434
Mitsubishi	423, 424
NAD	425, 426, 447
Nakamichi	427, 428
NEC	429
Onkyo	430
Panasonic	431, 432
Philips	421, 433, 434
Pioneer	431, 435
Quasar	432
Radio Shack	431, 436, 439, 440, 441
RCA	437
Sanyo	438, 439
Scott	440
Sharp	441, 442
Sony	443, 444, 445
Soundesign	461, 498, 501, 502
Sylvania	433
Teac	446
Technics	432, 459
Toshiba	447
Yamaha	448
Zenith	460, 461, 498, 501, 502

AUDIO TAPE DECKS

Brand	Codes
Denon	455
Harman/Kardon	456
JVC	457
Kenwood	450
Onkyo	458
Philips DCC	454
Pioneer	451, 478
Sony	452
Technics	454, 497
Yamaha	453

AUDIO TUNERS AND AMPLIFIERS

Brand	Codes
Denon	462, 463
Fisher	464
Goldstar	460
Harman/ Kardon	465
JVC	466
Kenwood	468, 469
Marantz	472, 503
Onkyo	473
Philips	475, 476
Pioneer	477, 478, 479
Radio Shack	487, 488
Realistic	480
Sanyo	481
Scott	482
Sharp	483
Sherwood	487, 488
Sony	489, 490, 491, 492
Soundesign	461, 498, 501, 502
Teac	494, 495
Technics	497
Yamaha	496
Zenith	460, 461, 498, 501, 502

MODEL PARTS LIST

A	27CX31B511	(ZHT2772DT)
B	27CX31B521	(MZHT2772DT
C	27CX22B501	(CZHT2771DT)

D	27CX22B511	(ZHT2771DT)
E	27CX22B521	(MZHT2771DT)
F	27CX31B501	(CZHT2772DT)

NOTE: This combined parts list will enable you to more easily determine the part number for parts used on each model chassis or assembly. Each has been assigned a reference code (RC), which is in the first column.

RC	PART #	DESCRIPTION
ABCDEF	014-12038	CABINET TRAY 25V, MOLDED PLASTIC
ABCDEF	014-12185	CABINET REAR TV, MOLDED PLASTIC
CDE	014-12186-21	CABINET FRONT TV, MOLDED PLASTIC
ABF	014-12186-23	CABINET FRONT TV, MOLDED PLASTIC
ABCDEF	020-04330-30	COIL DEGAUSSER
ABCDEF	049-01368-03	SPEAKER OVAL (2)
ABCDEF	050-01699-03	CONNECTOR&CABLE ASSY, 2.5 MM, 5 CONTACT
ABCDEF	050-01989-01	CONNECTOR&CABLE ASSY, 2.5MM, 2 CONTACT
ABCDEF	050-01989-02	CONNECTOR&CABLE ASSY, 2.5MM, 2 CONTACT
ABCDEF	095-03797-05	TRANSFORMER DEFLECTION YOKE
ABCDEF	A68AGD01X1	VACUUM TUBE CRT, COLOR, 27 INCH DIAG
ABD	124-00220	SPACE COMMAND TRANSMITTER
CEF	124-00220-01	SPACE COMMAND TRANSMITTER
ABCDEF	152-00335	WEDGE YOKE SPACER/POSITIONER

RC	PART #	DESCRIPTION
ABCDEF	192-00887	LENS INFRARED
C	206-03326	INSTR BOOK OPERATION GUIDE
A	206-03328	INSTR BOOK OPERATION GUIDE
E	206-03325	INSTR BOOK OPERATION GUIDE
B	206-03327	INSTR BOOK OPERATION GUIDE
F	206-03333	INSTR BOOK OPERATION GUIDE
D	206-03324	INSTR BOOK OPERATION GUIDE
ABCDEF	A-18035-02	LINE CORD ASSY WITH JST CONNECTOR
ABCDEF	F-52621	KEYBOARD ASSY 10 POSITION
ABF	*009-01814	MODULE PIP
CDABCDEF	*009-01824	MODULE MTS AUDIO JACKPACK
ABCDEF	*009-01908	MODULE MAIN, 27V W/COMB FILTER (COMPONENT LEVEL SERVICE ONLY)

* = For all components, Refer to Module or Assembly Parts List.

9-1814 PIP MODULE

REF	PART #	DESCRIPTION
L2001, L2004	020-04129-20	COIL 10 MICROHENRY
L2003	020-04277-73	COIL 3.3 MICROHENRY
C2007	022-08048-24	CAPACITOR 0.10 MFD 5% 50V
C2041	022-08049	CAPACITOR 0.0010 MFD 10% 50V
C2022	022-08227-09	CAPACITOR 0.068 MFD 5% 50V
C2017, C2018	022-08227-11	CAPACITOR 0.1 MFD 5% 50V
C2040	022-08227-11	CAPACITOR 0.1 MFD 5% 50V
C2008, C2019	022-08227-15	CAPACITOR 0.22 MFD 5% 50V
C2032	022-08227-15	CAPACITOR 0.22 MFD 5% 50V
C2006, C2033	022-08241-12	CAPACITOR 12 PFD 5% 50V
C2060	022-08241-34	CAPACITOR 100 PFD 5% 50V
C2026, C2047	022-08309-11	CAPACITOR 47 MFD 20% 16V
C2026, C2047	022-08309-11	CAPACITOR 47 MFD 20% 16V
C2002, C2011	022-08312-07	CAPACITOR 4.7 MFD 20% 50V
C2015, C2024	022-08312-08	CAPACITOR 10 MFD 20% 50V
C2046	022-08312-08	CAPACITOR 10 MFD 20% 50V
C2003m, C2045m,	022-08352-12	CAPACITOR 10 PFD +0.5 & -0.5 PFD 5
C2050m	022-08352-12	CAPACITOR 10 PFD +0.5 & -0.5 PFD 5
C2010m, C2014m	022-08352-28	CAPACITOR 47 PFD 5% 50V
C2048m, C2049m	022-08353-20	CAPACITOR 22 PFD 10% 50V
C2001m, C2028m	022-08353-36	CAPACITOR
C2021m	022-08366-13	CAPACITOR 2,700 PFD 10% 50V
C2009m, C2031m	022-08367-08	CAPACITOR 1,000 PFD 20% 50V
C2035m	022-08367-12	CAPACITOR 2,200 PFD 20% 50V
C2205m, C2012m,	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C2013m, C2016m	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C2023m, C2025m	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C2029m, C2030m	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C2036m, C2037m	022-08369-20	CAPACITOR 10,000 PFD 20% 25V

REF	PART #	DESCRIPTION
C2042m, C2043m	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C2052m, C2053m	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C2054m	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
2A2, 2B2	058-00636-06	CONNECTOR MULTIPRONG
R2035, R2038	063-10235-72	RESISTOR FILM 1K OHM 5% 1/4W
R2010	063-10235-80	RESISTOR FILM 2.2K OHM 5% 1/4W
R2005	063-10235-98	RESISTOR FILM 12K OHM 5% 1/4W
R2037	063-10236	RESISTOR FILM 15K OHM 5% 1/4W
R2036	063-10236-08	RESISTOR FILM 33K 5% 1/4W
R2013	063-10236-16	RESISTOR FILM 68K OHM 5% 1/4W
R2014	063-10236-20	RESISTOR FILM 100K OHM 5% 1/4W
J001m	063-11059	RESISTOR THICK FILM CHIP 0 OHM 5% 1/10W
R2203m, R2004m	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R2011m, R2012m,	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R2015m, R2016m	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R2017m	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R2008m	063-11059-37	RESISTOR THICK FILM CHIP 330 OHM 5% 1/10W
R2202m, R2021m	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R2028m	063-11059-54	RESISTOR THICK FILM CHIP 1.6K OHM 5% 1/10W
R2019m	063-11059-59	RESISTOR THICK FILM CHIP 2.7K OHM 5% 1/10W
R2020m	063-11059-75	RESISTOR THICK FILM CHIP 12K OHM 5% 1/10W
R2001m	063-11059-90	RESISTOR THICK FILM CHIP 51K OHM 5% 1/10W
R22009m	063-11059-92	RESISTOR THICK FILM CHIP 62K OHM 5% 1/10W
R2006m	063-11060-13	RESISTOR THICK FILM CHIP 470K OHM 5% 1/10W
D2000, D2001	103-00461	DIODE ULTRA FAST SWITCHING
D2002	103-00461	DIODE ULTRA FAST SWITCHING
Q2000	121-01310	TRANSISTOR NPN, SILICON
IC2000	221-00987	INTEGRATED CKT PIP CONTROLLER
X2002, X2003	224-00061-04	CRYSTAL QUARTZ, 14.31818 MHZ
X2001	224-00201	RESONATOR CERAMIC, 503N KHZ

** Critical Safety Components Shaded

COMPONENT PARTS LIST

9-1824 MTS AUDIO JACKPACK MODULE

NOTE: This combined parts list will enable you to more easily determine the part number for parts used on each model chassis or assembly. Each has been assigned a reference code (RC), which is in the first column.

REF	PART #	DESCRIPTION
	012-10681-10	MOLDED PLASTIC PANEL, JACK PACK
	019-00957-07	CLIP TRANSISTOR MOUNTING
C1419	022-07669-14	CAPACITOR 3.3 MFD 10% 50V
C1414	022-07669-15	CAPACITOR 10 MFD 10% 50V
C1420	022-08049-13	CAPACITOR
C0842, C0853	022-08049-24	CAPACITOR 0.10 MFD 10% 50V
C0863	022-08049-24	CAPACITOR 0.10 MFD 10% 50V
C1416, C1417	022-08188-05	CAPACITOR 10 MFD 20% 25V
C1426, C1427	022-08188-05	CAPACITOR 10 MFD 20% 25V
C1422	022-08227-07	CAPACITOR 0.047 MFD 5% 50V
C1424	022-08257-17	CAPACITOR 2700 PFD 10% 50V
C1421	022-08257-21	CAPACITOR 5600 PFD 10% 50V
C0843, C0852	022-08309-12	CAPACITOR 100 MFD 20% 16V
C0862, C1430	022-08309-12	CAPACITOR 100 MFD 20% 16V
CX0854, CX0864	022-08309-16	CAPACITOR 1000 MFD 20% 16V
CX0841	022-08310-16	CAPACITOR 1000 MFD 20% 25V
C1415, C1418	022-08312-04	CAPACITOR 1 MFD 20% 50V
C1408, C1410, C1425,	022-08312-07	CAPACITOR 4.7 MFD 20% 50V
C1428, C1432	022-08312-07	CAPACITOR 4.7 MFD 20% 50V
C0851, C0861, C1413	022-08312-08	CAPACITOR 10 MFD 20% 50V
C1450M, C1452M	022-08352-36	CAPACITOR 100 PFD 5% 50V
C0855M, C0856M	022-08366-08	CAPACITOR 1,000 PFD 10% 50V
C1402M, C1404M	022-08366-18	CAPACITOR 6,800 PFD 10% 50V
C1431M	022-08368-20	CAPACITOR 10,000 PFD 10% 25V
C1401M, C1403M	022-08370-22	CAPACITOR 15,000 PFD 10% 16V
C1406M	022-08370-24	CAPACITOR 22,000 PFD 10% 16V
9L4, 9R4	058-00542-02	PLUG 2.5 MM, 2 POSITION
9B4	058-00636-08	CONNECTOR MULTIPRONG
9A4	058-00636-09	CONNECTOR MULTIPRONG

REF	PART #	DESCRIPTION
J0802, J0804	078-03402	CONNECTOR PHONO, RED
J0801, J0803	078-03402-01	CONNECTOR PHONO, WHITE
J0800	078-3402-02	CONNECTOR PHONO, YELLOW
SW0801	085-01778-03	SWITCH SLIDE, REGULAR
R0859, R0869	063-10235-24	RESISTOR FILM 10 OHM 5% 1/4W
R0001	063-10235-45	RESISTOR FILM 75 OHM 5% 1/4W
R1401, R1402	063-10235-48	RESISTOR FILM 100 OHM 5% 1/4W
R0843	063-10235-60	RESISTOR FILM 330 OHM 5% 1/4W
RX0842	063-10235-72	RESISTOR FILM 1K OHM 5% 1/4W
R0854, R0864, R1423	063-10235-80	RESISTOR FILM 2.2K OHM 5% 1/4W
R1424, R1427, R1428	063-10235-80	RESISTOR FILM 2.2K OHM 5% 1/4W
R0844, R0858, R0868	063-10235-88	RESISTOR FILM 4.7K OHM 5% 1/4W
RX0853, RX0863	063-10559-12	RESISTOR FILM 3.3 OHM 5% 1/4W
RX0846	063-10565-08	RESISTOR FILM 2.2 OHM 5% 1/2W
R0852M, R0862M	063-11059-57	RESISTOR THICK FILM CHIP 2.2K OHM 5% 1/10W
R1407M, R1408M	063-11059-61	RESISTOR THICK FILM CHIP 3.3K OHM 5% 1/10W
R1405M	063-11059-63	RESISTOR THICK FILM CHIP 3.9K OHM 5% 1/10W
R1421M	063-11059-71	RESISTOR THICK FILM CHIP 8.2K OHM 5% 1/10W
R0851M, R0861M	063-11059-73	RESISTOR THICK FILM CHIP 10K OHM 5% 1/10W
R1422M	063-11059-73	RESISTOR THICK FILM CHIP 10K OHM 5% 1/10W
R1477M	063-11059-85	RESISTOR THICK FILM CHIP 33K OHM 5% 1/10W
R0809M	063-11059-89	RESISTOR THICK FILM CHIP 47K OHM 5% 1/10W
R1405M	063-11059-97	RESISTOR THICK FILM CHIP 100K OHM 5% 1/10W
R1424M, R1426M	063-11060-21	RESISTOR THICK FILM CHIP 1 MEG OHM 5% 1/10W
R1404M	063-11244-76	RESISTOR THICK FILM CHIP 61.9K OHM 1% 1/10W
Q0800	121-01310	TRANSISTOR NPN, SILICON
IC0804	221-00598-01	INTEGRATED CKT AUDIO POWER AMPLIFIER
IC1400	221-01127	INTEGRATED CKT MTS STEREO DECODER/VOL.L

COMPONENT PARTS LIST

9-1908 MAIN, 27V WITH COMB FILTER MODULE

REF	PART #	DESCRIPTION
	012-10696	MOLDED PLASTIC BRACKET
L1202	020-03907-12	COIL 10 MICROHENRY
L6000	020-03907-24	COIL 100 MICROHENRY
L1208	020-03907-25	COIL 120 MICROHENRY
LX3262	020-04073-01	COIL RCF
L6001, L6002, L6003	020-04129-08	COIL 1 MICROHENRY
L6003, L6004, L6005	020-04129-08	COIL 1 MICROHENRY
L6006, L6007, L6008	020-04129-08	COIL 1 MICROHENRY
L2401	020-04129-20	COIL 10 MICROHENRY
L1206	020-04277-09	COIL 0.82 MICROHENRY
L2202	020-04277-20	COIL 6.8 MICROHENRY
L2203	020-04277-22	COIL 10 MICROHENRY
L1203	020-04277-23	COIL 12 MICROHENRY
L5100	020-04277-29	COIL 39 MICROHENRY
L1201	020-04277-39	COIL 10 MICROHENRY
L1205	020-04278	COIL RCF, TUNABLE
LX3201	020-04378	COIL CHOKE
L3407	020-04462-18	COIL 33 MICROHENRY
	020-04506	COIL RCF, FIXED
CX3400, CX3402	022-07431-06	CAPACITOR 0.0047 MFD +20 % -20 %
C5104	022-07523-01	CAPACITOR 0.01 MFD +80 % & -20 %
C2601, C3211	022-07774-16	CAPACITOR 0.022MFD 10% 100V
CX3411	022-07774-18	CAPACITOR 0.033 MFD 10% 100V
C2106, C2232	022-07774-24	CAPACITOR 0.1 MFD 10% 100V
C3419, C3421	022-07786	CAPACITOR 1000 PFD 10% 500V
CX3410, CX3412	022-07786	CAPACITOR 1000 PFD 10% 500V
CX3418	022-07786-01	CAPACITOR 220 PFD 10% 500V
C5111	022-07786-02	CAPACITOR 0.01 MFD 10% 500V
CX3401, C3237	022-07786-10	CAPACITOR 470 PFD 10% 500V
C3269, C3271	022-07786-10	CAPACITOR 470 PFD 10% 500V
C5109,	022-07786-10	CAPACITOR 470 PFD 10% 500V
CX3007, C3260	022-07786-10	CAPACITOR 470 PFD 10% 500V
C3273	022-07786-10	CAPACITOR 470 PFD 10% 500V
C3408	022-07786-10	CAPACITOR 470 PFD 10% 500V
C3209	022-07786-17	CAPACITOR 2200 PFD 10% 500V
CX3403, CX3404	022-07811	CAPACITOR 1000 PFD 10% 1000V
CX3406	022-07811	CAPACITOR 1000 PFD 10% 1000V
	022-07867-10	CAPACITOR 0.1 MFD 20% 250VAC
	022-08008-12	CAPACITOR .01 MFD 5% 1250V
C6001	022-08049-20	CAPACITOR 0.047 MFD 10% 50V
C1222, C2114	022-08049-24	CAPACITOR 0.10 MFD 10% 50V
C2115, C3426	022-08049-24	CAPACITOR 0.10 MFD 10% 50V
CX3208	022-08057-01	CAPACITOR 4.7 MFD 20% 50V
CX3202	022-08116-01	CAPACITOR 0.012 MFD 5% 630V
CX3201	022-08116-05	CAPACITOR .027 MFD 5% 630V
CX3233	022-08159	CAPACITOR 0.68 MFD 10% 200V
CX3409	022-08160-01	CAPACITOR
C2401	022-08185-08	CAPACITOR 47 MFD 20% 6.3V
C2212	022-08227-11	CAPACITOR 0.1 MFD 5% 50V
CX3229	022-08229-28	CAPACITOR 0.015 MFD 3% 1600VDC
CX3261	022-08231-13	CAPACITOR 0.56 MFD 5% 200V
C5110	022-08241-36	CAPACITOR 120 PFD 5% 50V
C3215	022-08257-08	CAPACITOR 470 PFD 10% 50V
C1233, C2208	022-08308-15	CAPACITOR 470 MFD 20% 10V
C1217, C2229	022-08309-12	CAPACITOR 100 MFD 20% 16V
C3428, C6030	022-08309-12	CAPACITOR 100 MFD 20% 16V
CX3274	022-08309-12	CAPACITOR 100 MFD 20% 16V
C3430	022-08309-15	CAPACITOR 470 MFD 20% 16V

** Critical Safety Components Shaded

REF	PART #	DESCRIPTION
CX6027	022-08309-16	CAPACITOR 1000 MFD 20% 16V
C2108	022-08310-11	CAPACITOR 47 MFD 20% 25V
CX2110, CX3416	022-08310-12	CAPACITOR 100 MFD 20% 25V
C1220, CX2105	022-08310-13	CAPACITOR 220 MFD 20% 25V
CX3268	022-08310-13	CAPACITOR 220 MFD 20% 25V
CX3245	022-08310-15	CAPACITOR 470 MFD 20% 25V
CX3407, CX3431	022-08310-16	CAPACITOR 1000 MFD 20% 25V
CX2109, CX3424	022-08310-17	CAPACITOR 2200 MFD 20% 25V
C2203, C2204	022-08312	CAPACITOR 0.1 MFD 20% 50V
C2205	022-08312	CAPACITOR 0.1 MFD 20% 50V
C1229, C1232	022-08312-03	CAPACITOR 0.47 MFD 20% 50V
C1235	022-08312-03	CAPACITOR 0.47 MFD 20% 50V
C1207, C1208	022-08312-04	CAPACITOR 1 MFD 20% 50V
C2215, C2217	022-08312-04	CAPACITOR 1 MFD 20% 50V
C2218, C2219	022-08312-04	CAPACITOR 1 MFD 20% 50V
C2226, C2227	022-08312-04	CAPACITOR 1 MFD 20% 50V
C6020, C6064	022-08312-04	CAPACITOR 1 MFD 20% 50V
C2211, C6028	022-08312-05	CAPACITOR 2.2 MFD 20% 50V
C1211, C3248	022-08312-07	CAPACITOR 4.7 MFD 20% 50V
C6012	022-08312-07	CAPACITOR 4.7 MFD 20% 50V
C2216, C2233	022-08312-08	CAPACITOR 10 MFD 20% 50V
C2404, C5108	022-08312-08	CAPACITOR 10 MFD 20% 50V
C6032, CX2228	022-08312-08	CAPACITOR 10 MFD 20% 50V
CX3003	022-08312-08	CAPACITOR 10 MFD 20% 50V
CX3272	022-08312-11	CAPACITOR 47 MFD 20% 50V
CX3413	022-08313-09	CAPACITOR
CX3296	022-08317-08	CAPACITOR 10 MFD 20% 250V
C5105	022-08318-04	CAPACITOR 1 MFD 20% 350V
C2202M	022-08352-14	CAPACITOR 12 PFD 5% 50V
C6018M	022-08352-20	CAPACITOR 22 PFD 5% 50V
C6019M	022-08352-22	CAPACITOR 27 PFD 5% 50V
C1206M	022-08352-24	CAPACITOR 33 PFD 5% 50V
C2234M	022-08352-38	CAPACITOR 120 PFD 5% 50V
C1213M	022-08352-38	CAPACITOR 120 PFD 5% 50V
C2240M	022-08352-38	CAPACITOR 120 PFD 5% 50V
C2241M	022-08352-38	CAPACITOR 120 PFD 5% 50V
C2225M, C2236M	022-08352-42	CAPACITOR 180 PFD 5% 50V
C2250M	022-08352-48	CAPACITOR 330 PFD 5% 50V
C2221M	022-08353-20	CAPACITOR 22 PFD 10% 50V
C1212M, C3214M	022-08353-28	CAPACITOR 47 PFD 10% 50V
C6008M, C6009M	022-08353-28	CAPACITOR 47 PFD 10% 50V
C6010M, C6011M	022-08353-28	CAPACITOR 47 PFD 10% 50V
C6050M, C6051M	022-08353-28	CAPACITOR 47 PFD 10% 50V
C6000M, C6021M	022-08353-36	CAPACITOR 100 PFD 10% 50V
C6022M, C6023M	022-08353-36	CAPACITOR 100 PFD 10% 50V
C6024M	022-08353-36	CAPACITOR 100 PFD 10% 50V
C5101M, C5102M	022-08364-52	CAPACITOR 470 PFD 5% 50V
C5103M	022-08364-52	CAPACITOR 470 PFD 5% 50V
C2257M	022-08366-04	CAPACITOR 470 PFD 10% 50V
C6002M, C6005M	022-08366-05	CAPACITOR 560 PFD 10% 50V
C1221M, C1224M	022-08366-08	CAPACITOR 1,000 PFD 10% 50V
C1231M, C2237M	022-08366-08	CAPACITOR 1,000 PFD 10% 50V
C1202M, C6031M	022-08366-16	CAPACITOR 4,700 PFD 10% 50V
C1227M C1228M	022-08367-08	CAPACITOR 1,000 PFD 20% 50V
C1234M, C5107M	022-08367-08	CAPACITOR 1,000 PFD 20% 50V
C6052M, C6053M	022-08367-08	CAPACITOR 1,000 PFD 20% 50V
C6054M, C6055M	022-08367-08	CAPACITOR 1,000 PFD 20% 50V
C6056M, C6057M	022-08367-08	CAPACITOR 1,000 PFD 20% 50V

COMPONENT PARTS LIST

9-1908 MAIN, 27V WITH COMB FILTER MODULE

REF	PART #	DESCRIPTION
C6058M, C6059M	022-08367-08	CAPACITOR 1,000 PFD 20% 50V
C6060M, C6007M	022-08367-08	CAPACITOR 1,000 PFD 20% 50V
C6036M, C6061M	022-08367-08	CAPACITOR 1,000 PFD 20% 50V
C6062M	022-08367-08	CAPACITOR 1,000 PFD 20% 50V
C1215M, C1216M	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C1218M, C1219M	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C1223M, C1225M	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C1226M, C2207M	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C2209M, C1220M	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C1235M, C2402M	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C2403M, C6003M	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C6016M, C6026M	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C6029M, C6033M	022-08369-20	CAPACITOR 10,000 PFD 20% 25V
C1236M, C6006M	022-08371-24	CAPACITOR 22,000 PFD 20% 16V
C6025M	022-08371-24	CAPACITOR 22,000 PFD 20% 16V
CX3222	022-08386-01	CAPACITOR 270 PFD 10% 2000V
CX3220, CX3231	022-08386-05	CAPACITOR 560 PFD 10% 2000V
CX3420	022-08444-07	CAPACITOR 220 MFD 20% 200V
CX3405	022-08444-09	CAPACITOR 330 MFD 20% 200V
EX3401	038-00102	SPARK GAP HIGH VOLTAGE, 4 KV DC
2F5/5F2	050-01664-05	CONN. & CABLE ASSY, 2.5MM, 3 CONTACT, 2 UP
2C5/5C2	050-01667-05	CONN. & CABLE ASSY, 2.5MM, 6 CONTACT, 2 UP
2K6, 4G9	058-00526-05	PLUG 0.098P 5 CONTACT
3T8	058-00546-02	PLUG
3Y3	058-00546-04	PLUG MULTIPRONG
3R8ALT	058-00570-02	PLUG MULTIPRONG
L2200	063-10235-24	RESISTOR FILM 10 OHM 5% 1/4W
R2251, R5101	063-10235-40	RESISTOR FILM 47 OHM 5% 1/4W
R5103, RX3406	063-10235-40	RESISTOR FILM 47 OHM 5% 1/4W
R1223, R2212	063-10235-48	RESISTOR FILM 100 OHM 5% 1/4W
R2219, R2220	063-10235-48	RESISTOR FILM 100 OHM 5% 1/4W
R2278	063-10235-48	RESISTOR FILM 100 OHM 5% 1/4W
R1209, R2282	063-10235-56	RESISTOR FILM 220 OHM 5% 1/4W
R3243	063-10235-56	RESISTOR FILM 220 OHM 5% 1/4W
R2231	063-10235-64	RESISTOR FILM 470 OHM 5% 1/4W
R2238	063-10235-66	RESISTOR FILM 560 OHM 5% 1/4W
R5107	063-10235-67	RESISTOR FILM 620 OHM 5% 1/4W
R1210, R2107	063-10235-72	RESISTOR FILM 1K OHM 5% 1/4W
R2204, R2281	063-10235-72	RESISTOR FILM 1K OHM 5% 1/4W
R2291, R3203	063-10235-72	RESISTOR FILM 1K OHM 5% 1/4W
R6028, RX3202	063-10235-72	RESISTOR FILM 1K OHM 5% 1/4W
R1228	063-10235-76	RESISTOR FILM 1.5K OHM 5% 1/4W
R2122, R2248	063-10235-80	RESISTOR FILM 2.2K OHM 5% 1/4W
R5132	063-10235-80	RESISTOR FILM 2.2K OHM 5% 1/4W
R3201	063-10235-82	RESISTOR FILM 2.7K OHM 5% 1/4W
R2109	063-10235-84	RESISTOR FILM 3.3LK OHM 5% 1/4W
R3248	063-10235-86	RESISTOR FILM 3.9K OHM 5% 1/4W
R2233, R3255	063-10235-88	RESISTOR FILM 4.7K OHM 5% 1/4W
R6001, R6005	063-10235-88	RESISTOR FILM 4.7K OHM 5% 1/4W
RX2276	063-10235-88	RESISTOR FILM 4.7K OHM 5% 1/4W
R2279, R2610	063-10235-96	RESISTOR FILM 10K OHM 5% 1/4W
R3247, R6029	063-10235-96	RESISTOR FILM 10K OHM 5% 1/4W
R6039	063-10235-96	RESISTOR FILM 10K OHM 5% 1/4W
R2277	063-10236-02	RESISTOR FILM 18K OHM 5% 1/4W
R6023	063-10236-04	RESISTOR FILM 22K OHM 5% 1/4W
R5121	063-10236-05	RESISTOR FILM 24K OHM 5% 1/4W
R6051	063-10236-17	RESISTOR FILM 75K OHM 5% 1/4W

REF	PART #	DESCRIPTION
R6036	063-10236-20	RESISTOR FILM 100K 5% 1/4W
R2146	063-10236-24	RESISTOR FILM 150K OHM 5% 1/4W
R2132	063-10236-26	RESISTOR FILM 180K OHM 5% 1/4W
R5116, R5117	063-10243-72	RESISTOR FILM 1K OHM 5% 1/2W
R5118, R5119	063-10243-72	RESISTOR FILM 1K OHM 5% 1/2W
R5120	063-10243-72	RESISTOR FILM 1K OHM 5% 1/2W
R5122	063-10244-28	RESISTOR FILM 220K OHM 5% 1/2W
R5123	063-10246-46	RESISTOR FILM 1.2M OHM 10% 1/2W
RX3401	063-10444-20	RESISTOR WIREWOUND 0.68 OHM 10% 5W
RX3261	063-10460-48	RESISTOR WIREWOUND 10 OHM 10% 10W
RX3205	063-10565	RESISTOR FILM 1 OHM 5% 1/2W
RX3277	063-10565-10	RESISTOR FILM 2.7 OHM 5% 1/2W
RX3299	063-10565-16	RESISTOR FILM 4.7 OHM 5% 1/4W
R2111, R2113	063-10565-61	RESISTOR FILM 360 OHM 5% 1/2W
RX3415	063-10710	RESISTOR THERMISTOR
RX3263	063-10832-69	RESISTOR FILM 750 OHM 5% 1W
RX5126, RX5127	063-10836-98	RESISTOR FILM 12K OHM 5% 2W
RX5128	063-10836-98	RESISTOR FILM 12K OHM 5% 2W
RX3411	063-10837	RESISTOR FILM15K OHM 5% 2W
RX3008	063-10936-37	RESISTOR FILM 2.21K OHM 1% 1/4W
RX3016, RX3022	063-10936-72	RESISTOR FILM 4.32K OHM 1% 1/4W
R2133, R3249	063-11007-56	CONTROL ROTARY, TRIMMER
J0002M, J00003M	063-11059	RESISTOR THICK FILM CHIP 0 OHM 5% 1/10W
J0004M, J0006M	063-11059	RESISTOR THICK FILM CHIP 0 OHM 5% 1/10W
J0007M, F0008M	063-11059	RESISTOR THICK FILM CHIP 0 OHM 5% 1/10W
R2246M, R6072M	063-11059	RESISTOR THICK FILM CHIP 0 OHM 5% 1/10W
R1226M	063-11059-09	22 OHM 5% 1/10W
R1230M	063-11059-13	RESISTOR THICK FILM CHIP 33 OHM 5% 1/10W
R2252M, R2266M	063-11059-17	RESISTOR THICK FILM CHIP 47 OHM 5% 1/10W
R2283M, R5102M	063-11059-17	RESISTOR THICK FILM CHIP 47 OHM 5% 1/10W
R5113M, R5114M	063-11059-17	RESISTOR THICK FILM CHIP 47 OHM 5% 1/10W
R5115M	063-11059-17	RESISTOR THICK FILM CHIP 47 OHM 5% 1/10W
R1216M, R1224M	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R1225M, R1229M	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R2247M, R3261M	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R6056M, R6024M	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R6025M, R6032M	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R6033M, R6034M	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
RX3236M	063-11059-25	RESISTOR THICK FILM CHIP 100 OHM 5% 1/10W
R1217M, R1218M	063-11059-29	RESISTOR THICK FILM CHIP 150 OHM 5% 1/10W
R5104M, R5105M	063-11059-29	RESISTOR THICK FILM CHIP 150 OHM 5% 1/10W
R5106M	063-11059-29	RESISTOR THICK FILM CHIP 150 OHM 5% 1/10W
R2214M, R2215M	063-11059-33	RESISTOR THICK FILM CHIP 220 OHM 5% 1/10W
R2214M, R2215M	063-11059-33	RESISTOR THICK FILM CHIP 220 OHM 5% 1/10W
R6052M	063-11059-33	RESISTOR THICK FILM CHIP 220 OHM 5% 1/10W
R2245M	063-11059-37	RESISTOR THICK FILM CHIP 330 OHM 5% 1/10W
R2229M, R2244M	063-11059-39	390 OHM 5% 1/10W
R1227M, R2207M	063-11059-41	RESISTOR THICK FILM CHIP 470 OHM 5% 1/10W
R2209M, R2211M	063-11059-41	RESISTOR THICK FILM CHIP 470 OHM 5% 1/10W
R2260M, R2261M	063-11059-41	RESISTOR THICK FILM CHIP 470 OHM 5% 1/10W
R2222M	063-11059-41	RESISTOR THICK FILM CHIP 470 OHM 5% 1/10W
R5108M, R5109M	063-11059-44	RESISTOR THICK FILM CHIP 620 OHM 5% 1/10W
R1232M, R2216M	063-11059-46	RESISTOR THICK FILM CHIP 750 OHM 5% 1/10W
R2284M, R2285M	063-11059-46	RESISTOR THICK FILM CHIP 750 OHM 5% 1/10W
R2286M	063-11059-46	RESISTOR THICK FILM CHIP 750 OHM 5% 1/10W
R1211M, R1213M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R2217M, R2226M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W

** Critical Safety Components Shaded

COMPONENT PARTS LIST

9-1908 MAIN, 27V WITH COMB FILTER MODULE

REF	PART #	DESCRIPTION
R2259M, R2265M,	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R6000M, R6002M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R6003M, R6007M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R6031M, R6037M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R1211M, R1213M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R2217M, R2226M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R2259M, R2265M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R6000M, R6002M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R6003M, R6007M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R6031M R6037M	063-11059-49	RESISTOR THICK FILM CHIP 1K OHM 5% 1/10W
R2108M, R2230M	063-11059-57	RESISTOR THICK FILM CHIP 2.2K OHM 5% 1/10W
R2270M, R2272M	063-11059-59	RESISTOR THICK FILM CHIP 2.7K OHM 5% 1/10W
R2274M	063-11059-59	RESISTOR THICK FILM CHIP 2.7K OHM 5% 1/10W
R2200M, R2240M	063-11059-61	RESISTOR THICK FILM CHIP 3.3K OHM 5% 1/10W
R2257M, R2271M	063-11059-63	RESISTOR THICK FILM CHIP 3.9K OHM 5% 1/10W
R2273M, R2275M	063-11059-63	RESISTOR THICK FILM CHIP 3.9K OHM 5% 1/10W
R5124M	063-11059-63	RESISTOR THICK FILM CHIP 3.9K OHM 5% 1/10W
R1212M, R2239M	063-11059-65	RESISTOR THICK FILM CHIP 4.7K OHM 5% 1/10W
R2242M, R6015M	063-11059-65	RESISTOR THICK FILM CHIP 4.7K OHM 5% 1/10W
R6016M	063-11059-65	RESISTOR THICK FILM CHIP 4.7K OHM 5% 1/10W
R1212M, R2239M	063-11059-65	RESISTOR THICK FILM CHIP 4.7K OHM 5% 1/10W
R2242M, R6015M	063-11059-65	RESISTOR THICK FILM CHIP 4.7K OHM 5% 1/10W
R6016M, R6017M	063-11059-65	RESISTOR THICK FILM CHIP 4.7K OHM 5% 1/10W
R6018M, R6046M	063-11059-65	RESISTOR THICK FILM CHIP 4.7K OHM 5% 1/10W
R2205M	063-11059-69	RESISTOR THICK FILM CHIP 6.8K OHM 5% 1/10W
R2206M, R2208M	063-11059-70	RESISTOR THICK FILM CHIP 7.5K OHM 5% 1/10W
R2210M	063-11059-70	RESISTOR THICK FILM CHIP 7.5K OHM 5% 1/10W
R1221M, R1222M	063-11059-73	RESISTOR THICK FILM CHIP 10K OHM 5% 1/10W
R1233M, R2234M	063-11059-73	RESISTOR THICK FILM CHIP 10K OHM 5% 1/10W
R2237M, R2290M	063-11059-73	RESISTOR THICK FILM CHIP 10K OHM 5% 1/10W
R3414M, R3442M	063-11059-73	RESISTOR THICK FILM CHIP 10K OHM 5% 1/10W
R6006M, R6008M	063-11059-73	RESISTOR THICK FILM CHIP 10K OHM 5% 1/10W
R6030M, R6040M	063-11059-73	RESISTOR THICK FILM CHIP 10K OHM 5% 1/10W
R6041M	063-11059-73	RESISTOR THICK FILM CHIP 10K OHM 5% 1/10W
R2143M, R2145M	063-11059-77	RESISTOR THICK FILM CHIP 15K OHM 5% 1/10W
R2235M, R2241M	063-11059-77	RESISTOR THICK FILM CHIP 15K OHM 5% 1/10W
R6038M	063-11059-77	RESISTOR THICK FILM CHIP 15K OHM 5% 1/10W
R2131M, R2218M	063-11059-81	RESISTOR THICK FILM CHIP 22K OHM 5% 1/10W
R3223M	063-11059-81	RESISTOR THICK FILM CHIP 22K OHM 5% 1/10W
R1234M, R2142M	063-11059-87	RESISTOR THICK FILM CHIP39K OHM 5% 1/10W
R2243M	063-11059-87	RESISTOR THICK FILM CHIP39K OHM 5% 1/10W
R2144M, R2147M	063-11059-89	RESISTOR THICK FILM CHIP 47K OHM 5% 1/10W
R6014M, R6019M	063-11059-89	RESISTOR THICK FILM CHIP 47K OHM 5% 1/10W
R1220M	063-11059-95	RESISTOR THICK FILM CHIP 82K OHM 5% 1/10W
R1235M, R2221M	063-11059-97	RESISTOR THICK FILM CHIP 100K OHM 5% 1/10W
R6020M, R6042M	063-11059-97	RESISTOR THICK FILM CHIP 100K OHM 5% 1/10W
R6045M, R2258M	063-11059-97	RESISTOR THICK FILM CHIP 100K OHM 5% 1/10W
R3212M	063-11060-05	RESISTOR THICK FILM CHIP 220K OHM 5% 1/10W
R2224M, R6047M	063-11060-13	RESISTOR THICK FILM CHIP 470K OHM 5% 1/10W
R6048M	063-11060-13	RESISTOR THICK FILM CHIP 470K OHM 5% 1/10W
R2141M	063-11060-18	RESISTOR THICK FILM CHIP 750K OHM 5% 1/10W
RX3408	063-11087-32	RESISTOR FILM 22 OHM 5% 1/2W
R3252	063-11087-64	RESISTOR FILM 470 OHM 55 1/2W
R3225, R3226	063-11087-66	RESISTOR FILM 560 OHM 5% 1/2W
R3418, R3421	063-11087-72	RESISTOR FILM 1.0K OHM 5% 1/2W
RX3404	063-11088-26	RESISTOR FILM 180 K OHM 5% 1/2W
RX2115	063-11110-06	RESISTOR FILM 1.8 OHM 5% 1/2W

REF	PART #	DESCRIPTION
RX2126	063-11110-08	RESISTOR FILM 2.2 OHM 5% 1/2W
RX2110	063-11110-10	RESISTOR FILM 2.7 OHM 5% 1/2W
RX3409	063-11110-16	RESISTOR FILM 4.7 OHM 5% 1/2W
RX3407	063-11156-40	RESISTOR FILM 47 OHM 5% 1W
RX2601	063-11158-96	RESISTOR FILM 10K OHM 2% 2W
RX3420	063-11160-20	RESISTOR FILM 6.8 OHM 5% 2W
RX3413	063-11160-35	RESISTOR FILM 30 OHM 5% 2W
RX3237	063-11164-02	RESISTOR FILM 1.2 OHM 5% 3W
RX3242	063-11214-16	RESISTOR FILM 0.51 OHM 5% 1/2W
	063-11235-03	RESISTOR FILM 0.18 OHM 10% 3W
RX3400	063-11264-01	RES. CARBON COMP. 5.6M OHM 20% 1/2W
LX3401	095-04285	TRANSFORMER LINE CHOKE
TX3204	095-04372	SWEEP XFMR COLOR FINAL
TX3404	095-04473	TRANSFORMER CHOPPER
T3205	095-04477	TRANSFORMER HORIZONTAL DRIVER
DX2101, DX3405	103-00254-01	DIODE LOW VOLTAGE GENERAL
ZD2252	103-00279-18	DIODE ZENER
ZD6001	103-00279-36	DIODE ZENER
DX3287	103-00326	DIODE LOW VOLTAGE GENERAL
DX3273	103-00339-04	DIODE LOW VOLTAGE GENERAL
DX3406, DX3407	103-00344-02	DIODE
DX3409	103-00344-02	DIODE
DX3006, DX3288	103-00344-04	DIODE LOW VOLTAGE GENERAL
DX3201	103-00344-06	DIODE LOW VOLTAGE GENERAL
D2202, D2203	103-00461	DIODE ULTRA FAST SWITCHING
D2206, D6003	103-00461	DIODE ULTRA FAST SWITCHING
D2251, D2260	103-00471	DIODE LOW VOLTAGE GENERAL
ZDX3004	103-00472	DIODE ZENER
Q3403, Q3404	121-01102	TRANSISTOR PNP, SILICON
Q5104	121-01140	TRANSISTOR NPN, SILICON
Q1205	121-01261	TRANSISTOR NPN, SILICON
Q3202, Q3206	121-01264-01	TRANSISTOR NPN, SILICON
Q5101, Q5102	121-01291-01	TRANSISTOR NPN, SILICON
Q5103	121-01291-01	TRANSISTOR NPN, SILICON
Q1203, Q1204	121-01310	TRANSISTOR NPN, SILICON
Q2200, Q2202	121-01310	TRANSISTOR NPN, SILICON
Q2203, Q2208	121-01310	TRANSISTOR NPN, SILICON
Q2209, Q2210	121-01310	TRANSISTOR NPN, SILICON
Q3202	121-01310	TRANSISTOR NPN, SILICON
Q2201, Q2204	121-01311	TRANSISTOR PNP, SILICON
Q2205, Q2206	121-01311	TRANSISTOR PNP, SILICON
Q2207	121-01311	TRANSISTOR PNP, SILICON
Q3402	121-01340	TRANSISTOR NPN, SILICON
QX3401	121-01348	TRANSISTOR NPN, SILICON
FX3401	136-00114-23	FUSE NORMAL LAG
FX3402	136-00148-23	FUSE NORMAL LAG
KX3401	195-00161	RELAY
DX3401	212-00172-04	RECTIFIER NTWK BRIDGE
IC3442	221-00166	INTEGRATED CKT 5 VOLT, 500MA
IC6001	221-00745-04	INTEGRATED CKT 4K BIT SERIAL EEPROM
ICX2201	221-00997-01	INTEGRATED CKT IF/VIDEO PROC. W/ W
IC6000	221-01138-02	INTEGRATED CKT MICROCONTROLLER
DL2400	223-00045	DELAY LINE
U1202	224-00023	CERAMIC FILTER 4.5 MHZ TRAP
CR2200	224-00027	CRYSTAL QUARTZ
U1200	224-00139-01	FILTER 4.5 MHZ CERAMIC BANDPASS
CRY6000	224-00157	CRYSTAL QUARTZ, 12.083916 MHZ

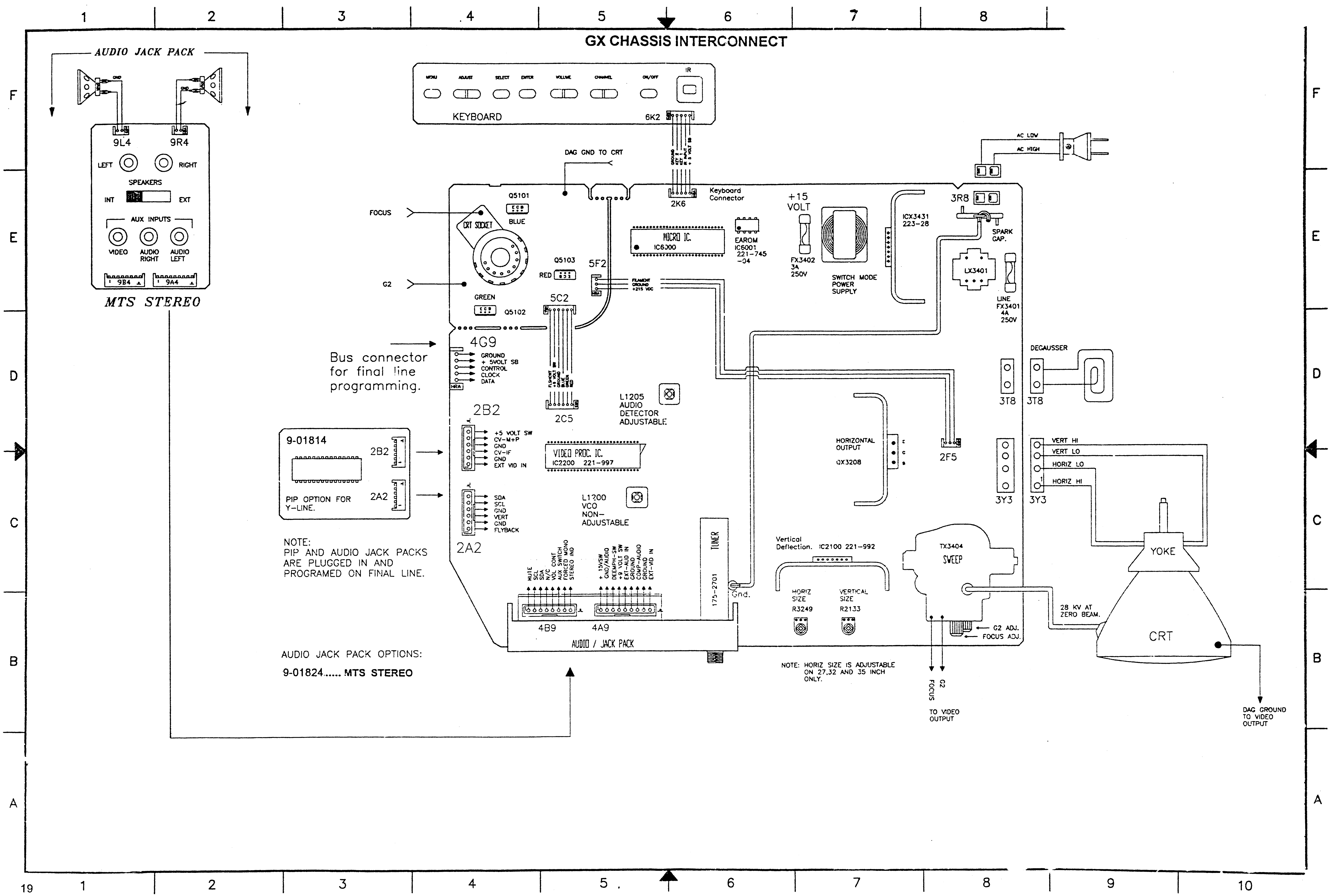
** Critical Safety Components Shaded

COMPONENT PARTS LIST

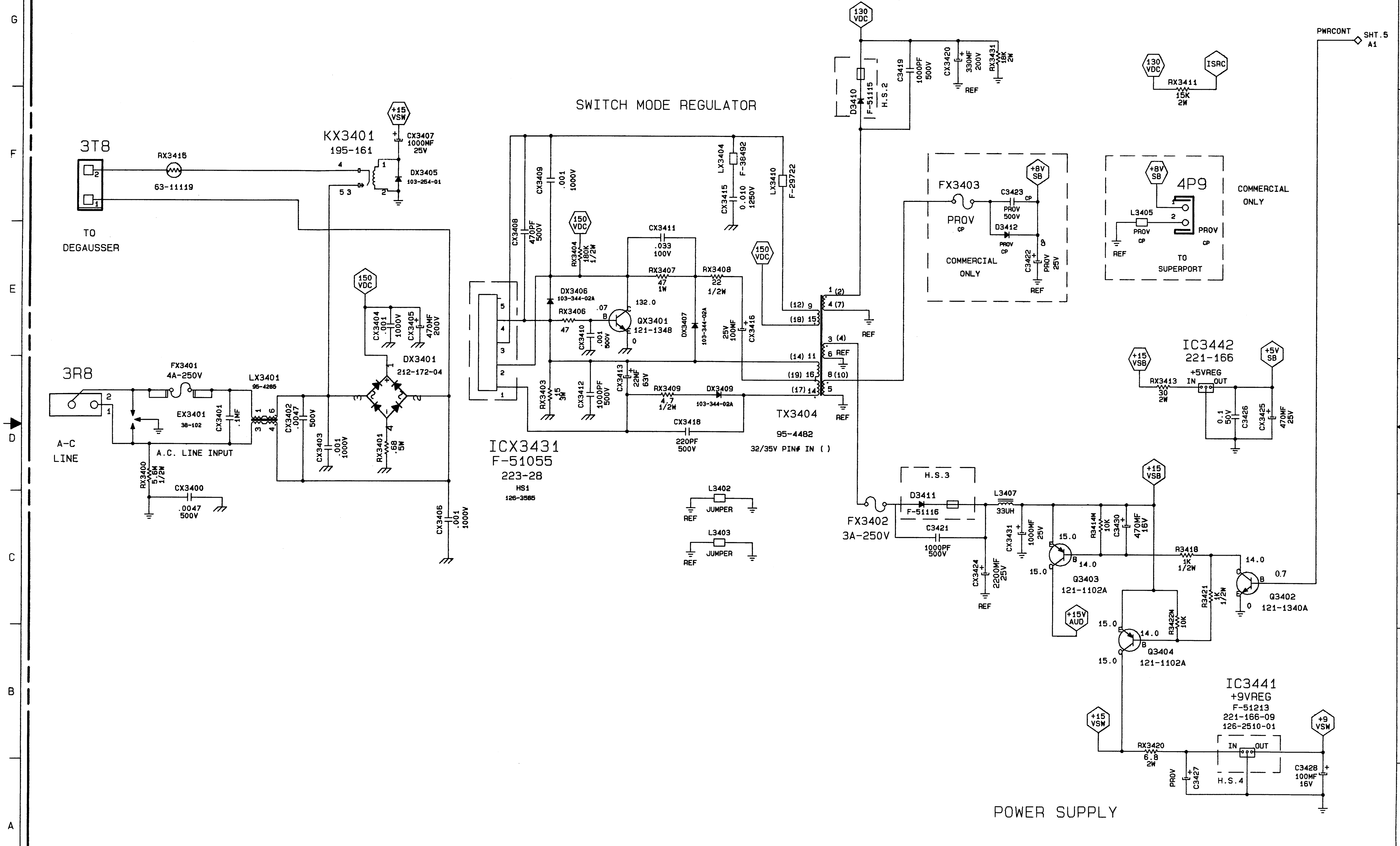
9-1908 MAIN, 27V WITH COMB FILTER MODULE

REF	PART #	DESCRIPTION
U1201	224-00160	FILTER SURFACE ACOUSTIC WAVE
CR2205	224-00178	RESONATOR CERAMIC, 503 KHZ
LX3410	F-29722	FERRITE BEAD AND WIRE ASSEMBLY
LX3404	F-38492	FERRITE BEAD AND WIRE ASSEMBLY
	F-41228	TRANSISTOR AND HEATSINK ASSY (SEE PARTS LIST BELOW)
LX3210	F-43283	FERRITE BEAD AND WIRE ASSEMBLY
	F-43628	DIODE AND FERRITE BEAD ASSEMBLY (SEE PARTS LIST BELOW)
W5100	F-47318	FERRITE BEAD AND WIRE ASSEMBLY
	F-49646	TRANSISTOR AND HEATSINK ASSEMBLY (SEE PARTS LIST BELOW)
	F-49700	WIRE&TERM ASSY SINGLE CONDUCTOR, SIMPLE
	F-51055	IC AND HEATSINK ASSEMBLY (SEE PART LIST BELOW)
	F-51056	IC AND HEATSINK ASSEMBLY (SEE PARTS LIST BELOW)
	F-51115	DIODE AND HEATSINK ASSEMBLY (SEE PARTS LISTED BELOW)
	F-51116	DIODE AND HEATSINK ASSEMBLY (SEE PARTS LISTED BELOW)
	F-51213	IC AND HEATSINK ASSEMBLY (SEE PARTS LISTED BELOW)
	F-41228	TRANSISTOR AND HEATSINK ASSY
Q3201	121-01237	TRANSISTOR PNP, SILICON
	F-43628	DIODE AND FERRITE BEAD ASSEMBLY
DX3207	103-00305-01	DIODE
	F-49646	TRANSISTOR AND HEATSINK ASSEMBLY
	019-00824-02	CLIP TRANSISTOR MOUNTING
	019-01197-02	CLIP HEATSINK MOUNTING
QX3208	121-01148	TRANSISTOR NPN, SILICON
	F-51055	IC AND HEATSINK ASSEMBLY
	019-01197-02	CLIP HEATSINK MOUNTING
ICX3431	223-00028	INTD CKT PKG, HYBRID VOLTAGE REGULATION
	F-51056	IC AND HEATSINK ASSEMBLY
	019-00824-02	CLIP TRANSISTOR MOUNTING
	019-01197-02	CLIP HEATS INK MOUNTING
IC2100	221-00992	INTEGRATED CKT VERTICAL DEFLECTION
	F-51115	DIODE AND HEATSINK ASSEMBLY
	012-09632	METAL STAMPING BRACKET
D3410	103-00339-04	DIODE LOW VOLTAGE GENERAL
	F-51116	DIODE AND HEATSINK ASSEMBLY
	012-09632	METAL STAMPING BRACKET
D3411	103-00417-03	DIODE LOW VOLTAGE GENERAL
	F-51213	IC AND HEATSINK ASSEMBLY
IC3441	221-00213-09	INTEGRATED CKT 9 VOLT, 1 AMP

** Critical Safety Components Shaded


GX CHASSIS INTERCONNECT
AUDIO JACK PACK
9L4
9R4
LEFT
RIGHT
SPEAKERS
INT
EXT
AUX INPUTS
VIDEO
AUDIO RIGHT
AUDIO LEFT
9B4
9A4
MTS STEREO
KEYBOARD
6K2
IR
DAG GND TO CRT
Keyboard Connector
2K6
+15 VOLT
FOCUS
CRT SOCKET
Q5101
BLUE
G2
Q5103
RED
GREEN
Q5102
5F2
5C2
MICRO IC.
IC6000
EAROM IC6001 221-745 -04
FX3402 3A 250V
SWITCH MODE POWER SUPPLY
ICX3431 223-28
3R8
SPARK GAP.
LX3401
LINE FX3401 4A 250V
AC LOW
AC HIGH
4G9
Bus connector for final line programming.
GROUND
+ 5VOLT SB
CONTROL
CLOCK
DATA
HRA
2B2
2C5
L1205 AUDIO DETECTOR ADJUSTABLE
DEGAUSSER
3T8
3T8
9-01814
2B2
2A2
PIP OPTION FOR Y-LINE.
+5 VOLT SW
CV-M+P
GND
CV-IF
GND
EXT VID IN
VIDEO PROC. IC.
IC2200 221-997
HORIZONTAL OUTPUT
QX3208
2F5
3Y3
3Y3
VERT HI
VERT LO
HORIZ LO
HORIZ HI
SDA
SCL
GND
VERT
GND
FLYBACK
L1200 VCO NON-ADJUSTABLE
2A2
NOTE: PIP AND AUDIO JACK PACKS ARE PLUGGED IN AND PROGRAMED ON FINAL LINE.
TUNER
175-2701
Gnd.
Vertical Deflection. IC2100 221-992
HORIZ SIZE R3249
VERTICAL SIZE R2133
TX3404 SWEEP
YOKE
28 KV AT ZERO BEAM.
CRT
G2 ADJ.
FOCUS ADJ.
4B9
4A9
AUDIO / JACK PACK
AUDIO JACK PACK OPTIONS:
9-01824...... MTS STEREO
NOTE: HORIZ SIZE IS ADJUSTABLE ON 27,32 AND 35 INCH ONLY.
FOCUS
G2
TO VIDEO OUTPUT
DAG GROUND TO VIDEO OUTPUT

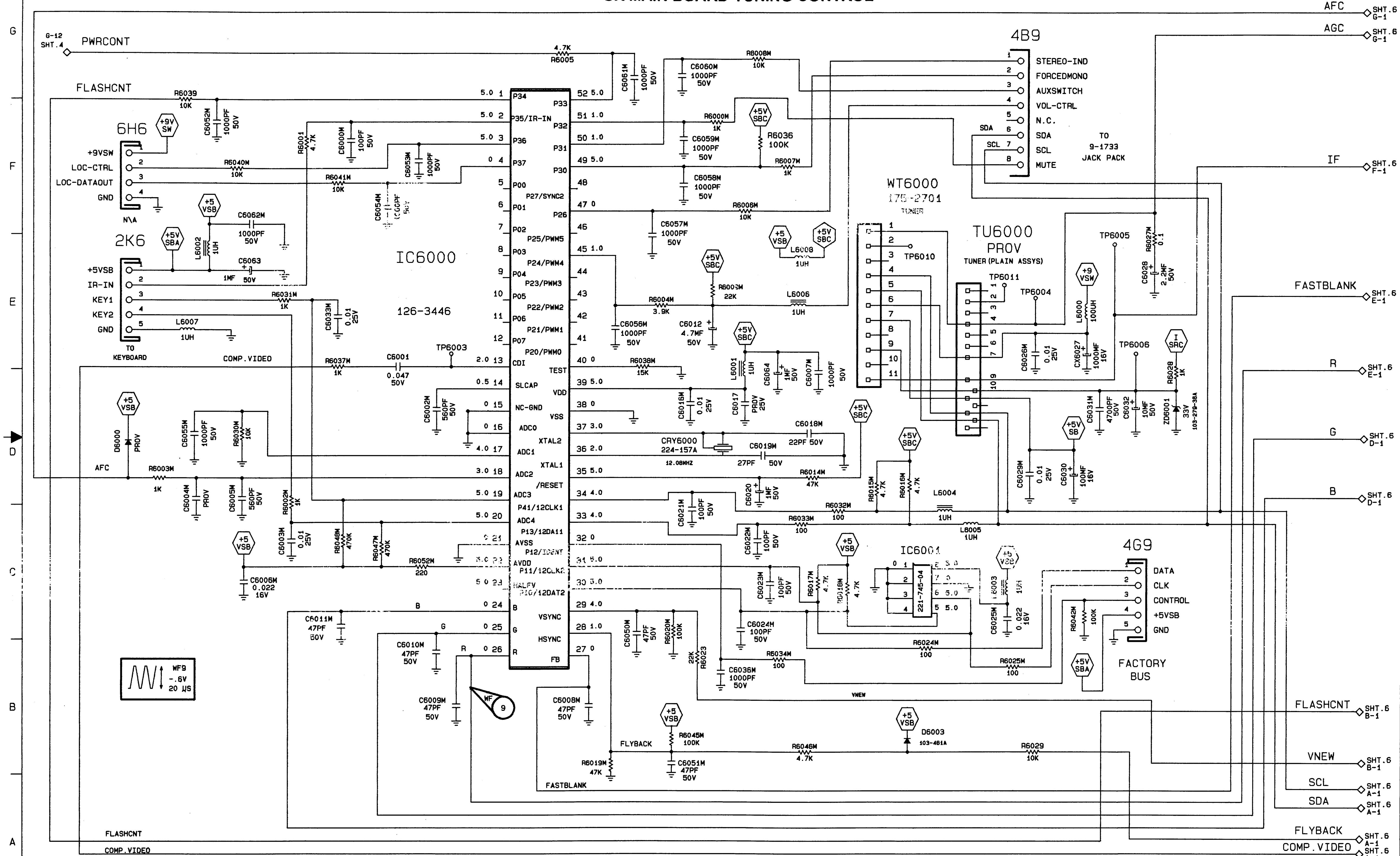
GX MAIN BOARD-SWITCH MODE REGULATOR



IMPORTANT SAFETY NOTE: THE COMPONENTS IDENTIFIED BY THE LETTER X IN ITS COMPONENT DESIGNATOR ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

ALL SYMBOLS WITH M ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT.

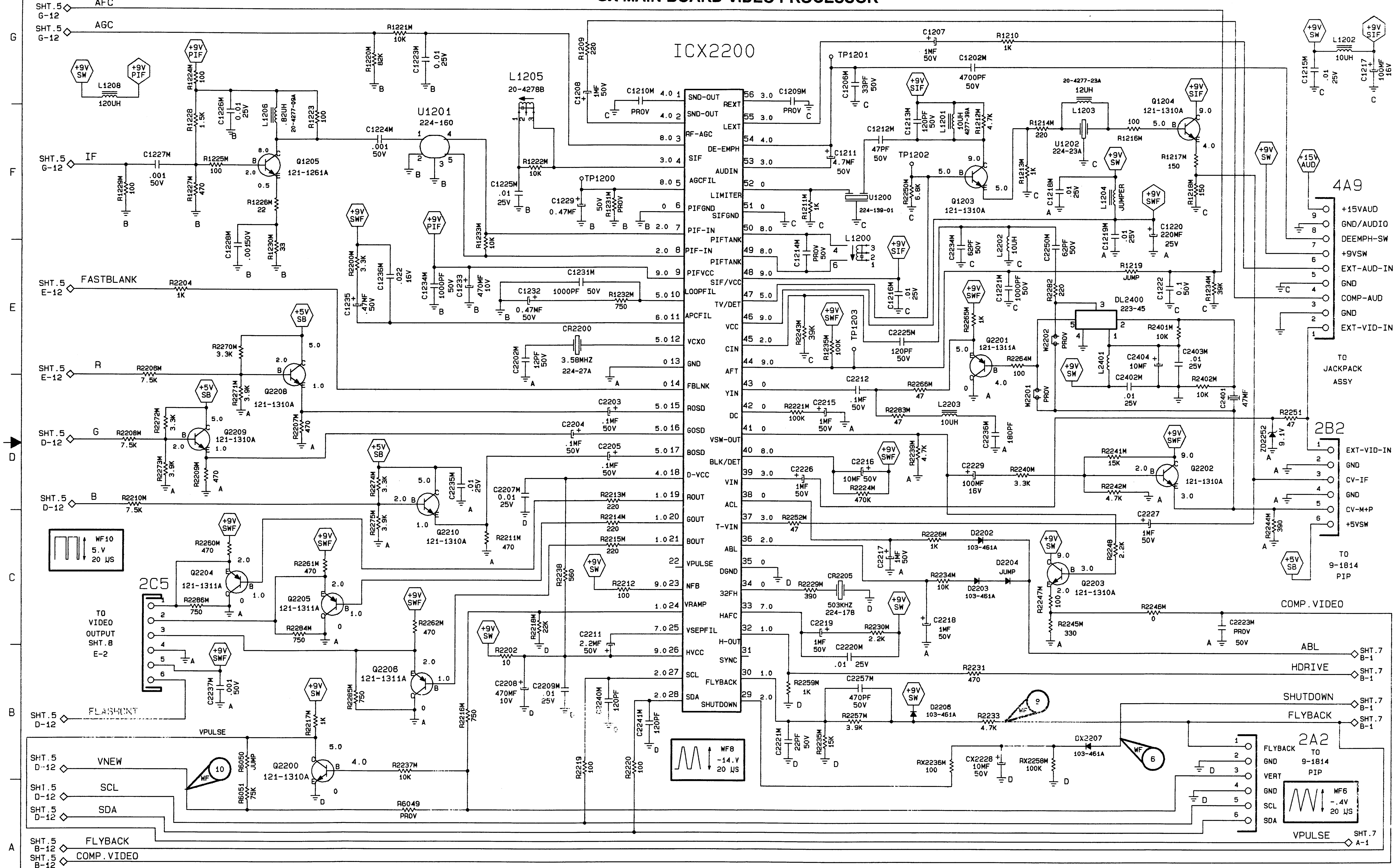
GX MAIN BOARD-TUNING CONTROL



IMPORTANT SAFETY NOTE: THE COMPONENTS IDENTIFIED BY THE LETTER X IN ITS COMPONENT DESIGNATOR ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

ALL SYMBOLS WITH M ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT.

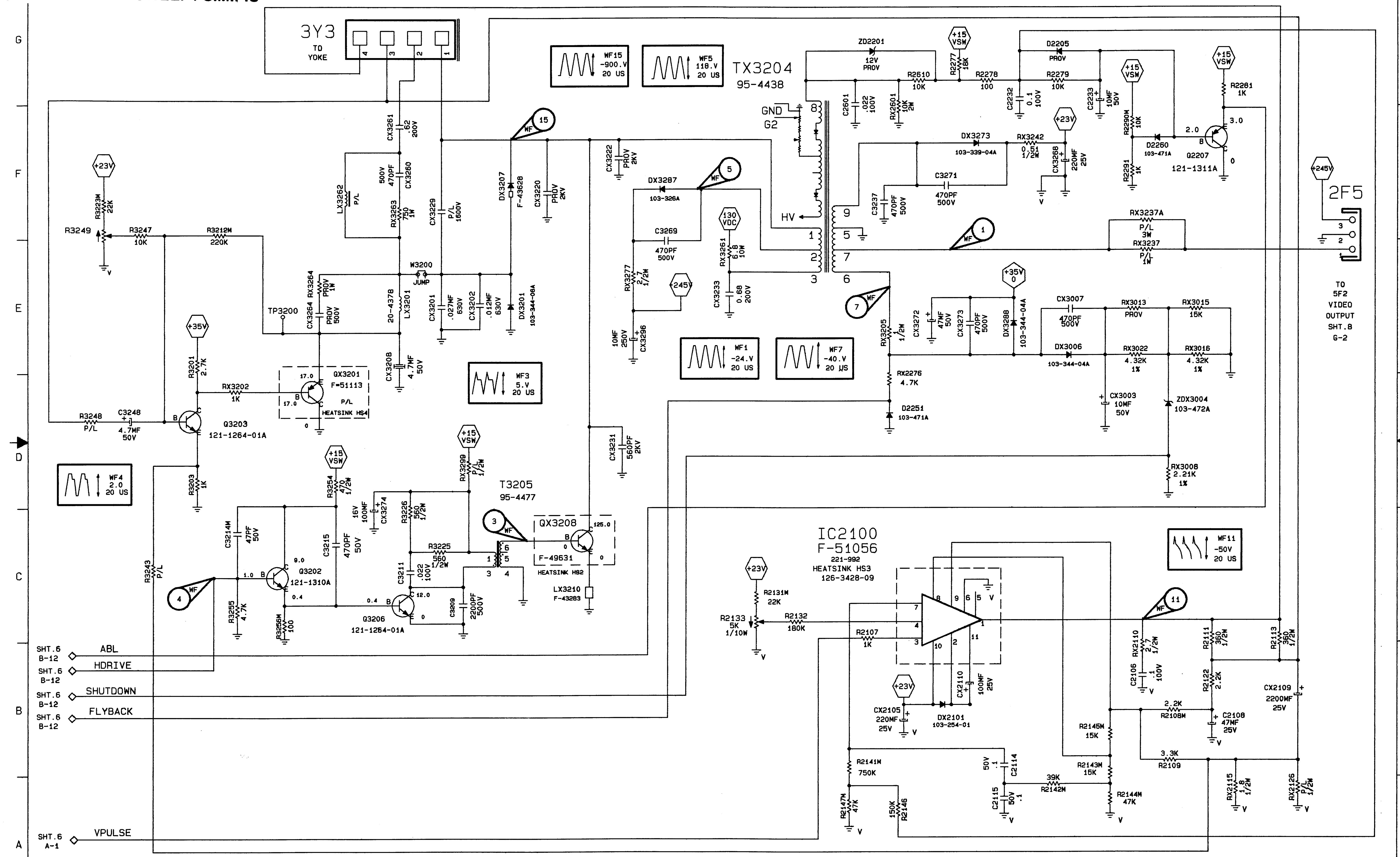
GX MAIN BOARD-VIDEO PROCESSOR



IMPORTANT SAFETY NOTE: THE COMPONENTS IDENTIFIED BY THE LETTER X IN ITS COMPONENT DESIGNATOR ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

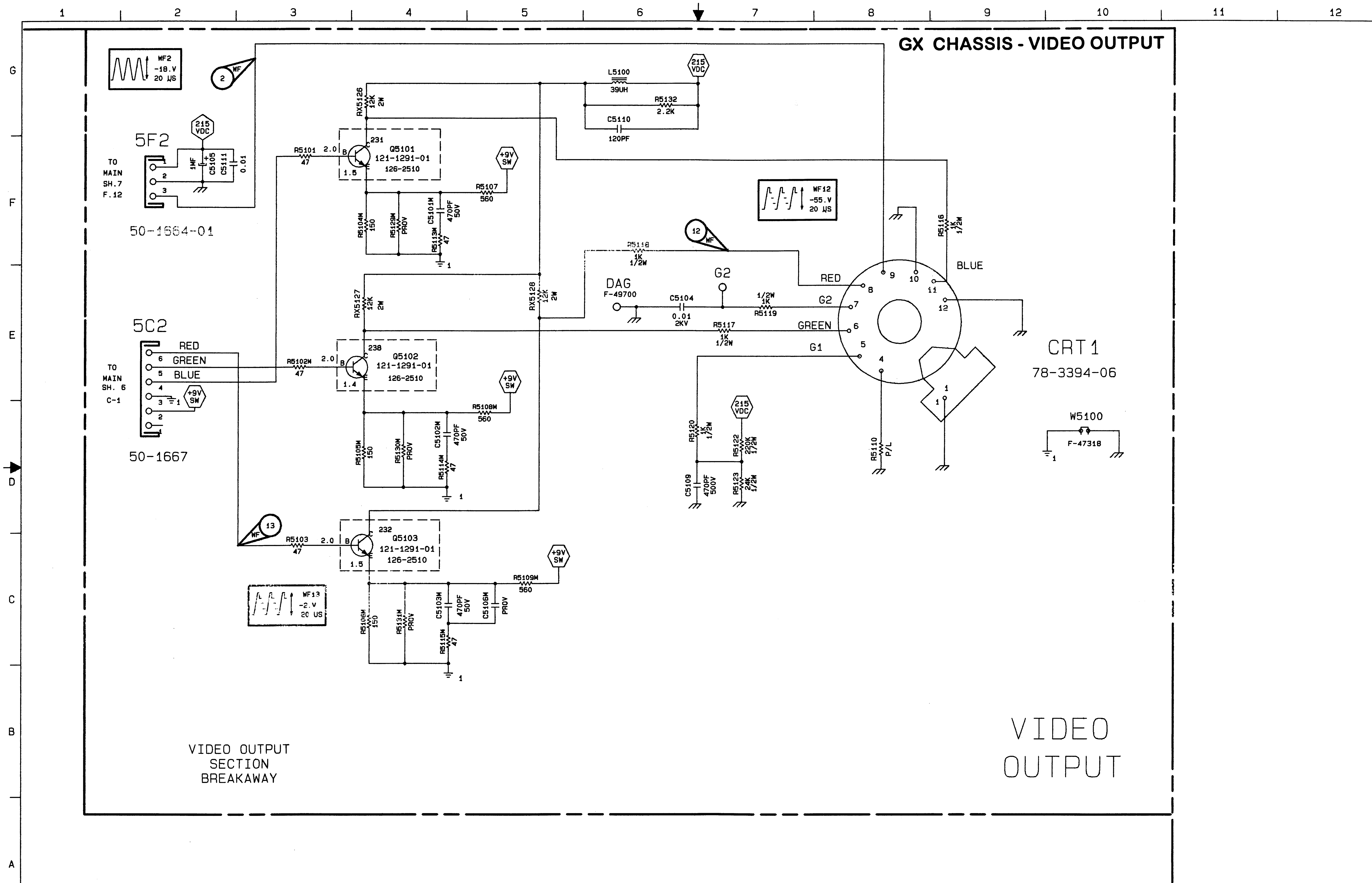
ALL SYMBOLS WITH M ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT.

GX MAIN BOARD-SWEEP / S.M.P.S



IMPORTANT SAFETY NOTE: THE COMPONENTS IDENTIFIED BY THE LETTER X IN ITS COMPONENT DESIGNATOR ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

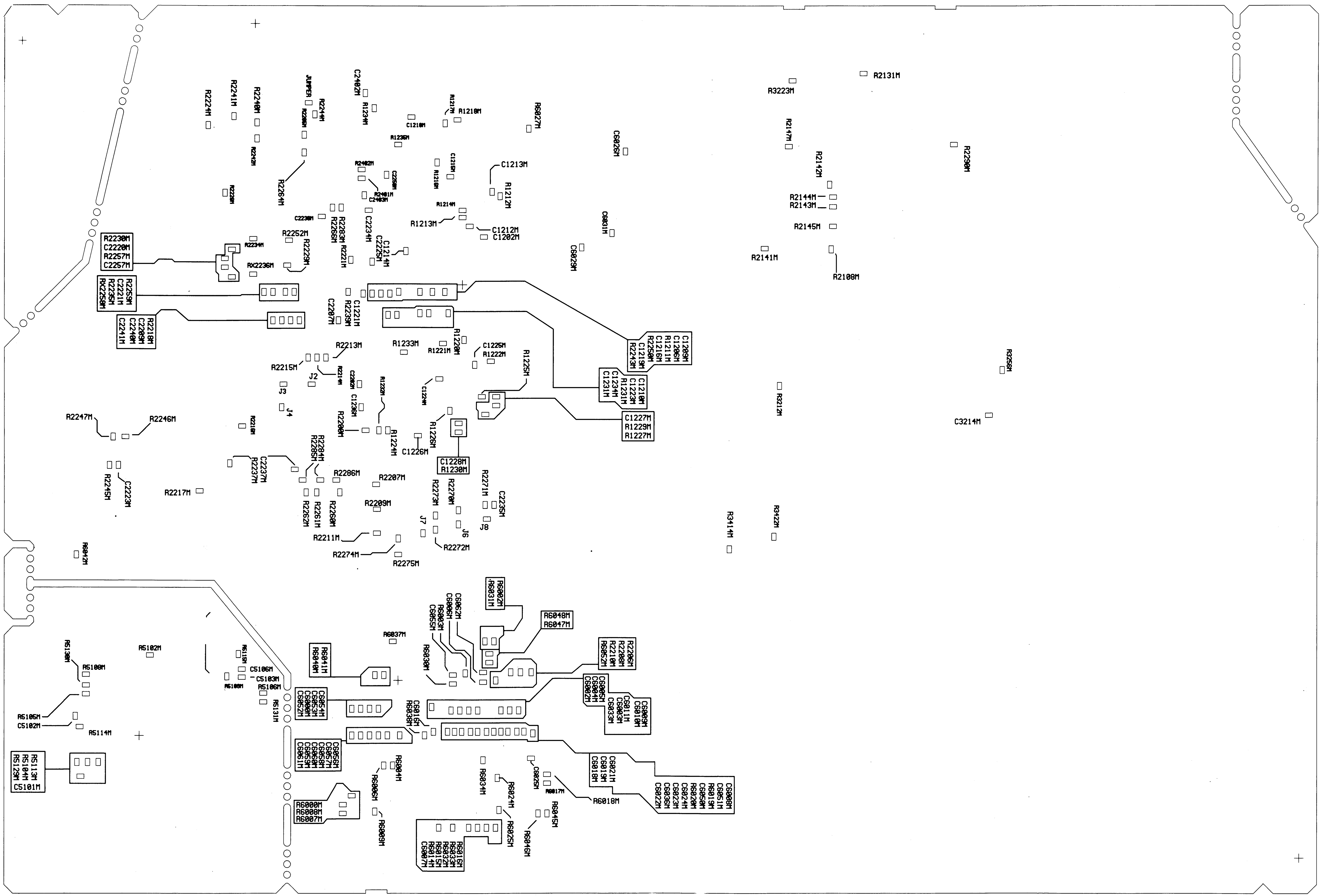
ALL SYMBOLS WITH M ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT.



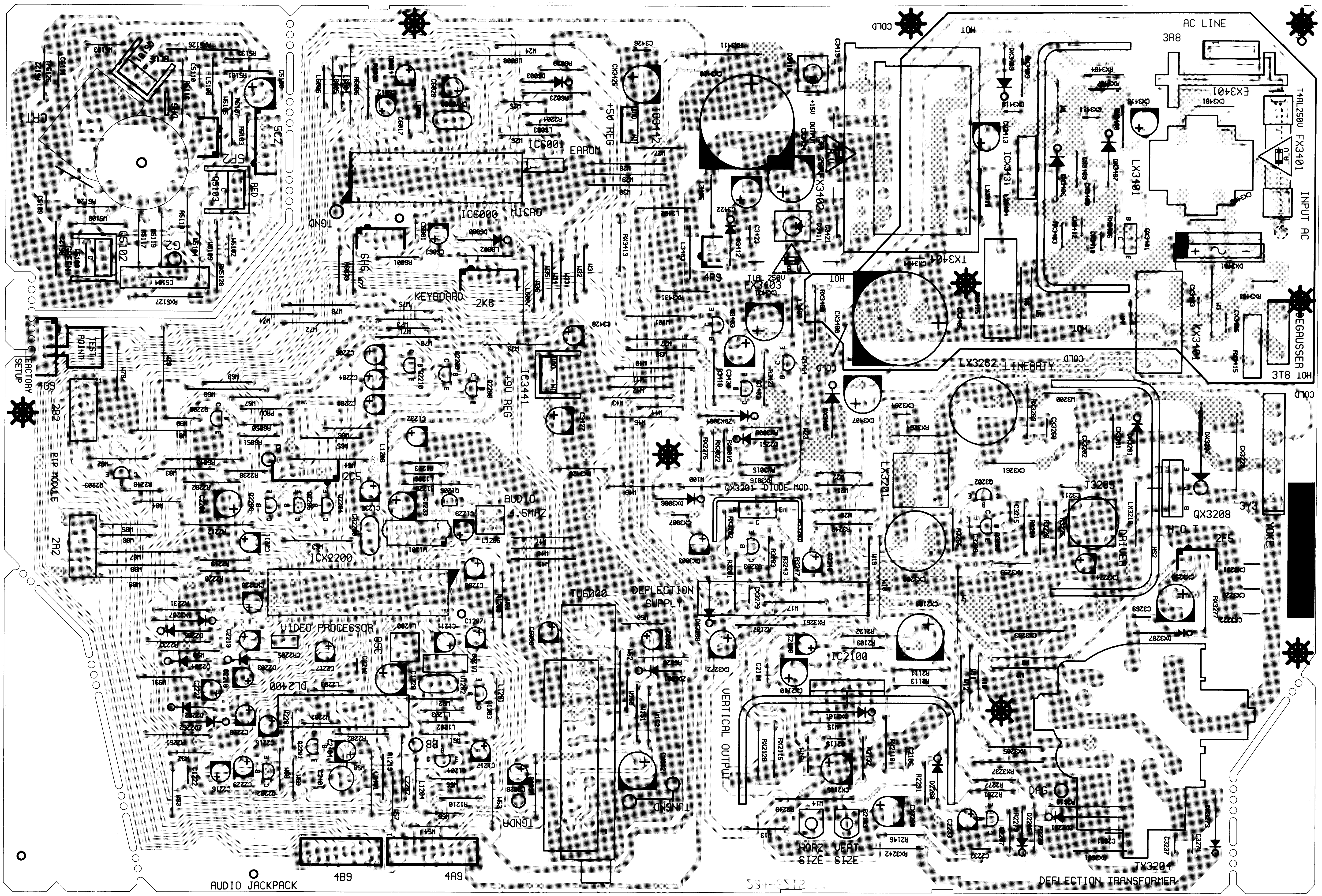
IMPORTANT SAFETY NOTE: THE COMPONENTS IDENTIFIED BY THE LETTER X IN ITS COMPONENT DESIGNATOR ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

ALL SYMBOLS WITH M ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT.

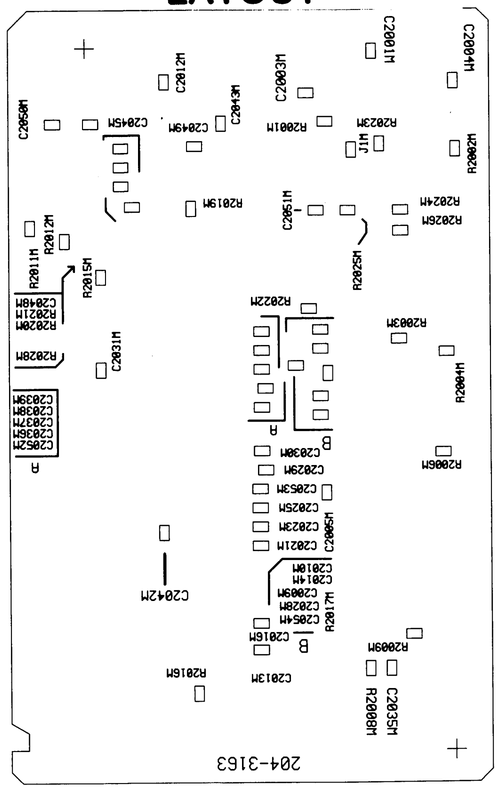
MAIN MODULE S.M.D. LAYOUT AS SEEN FROM FOIL SIDE

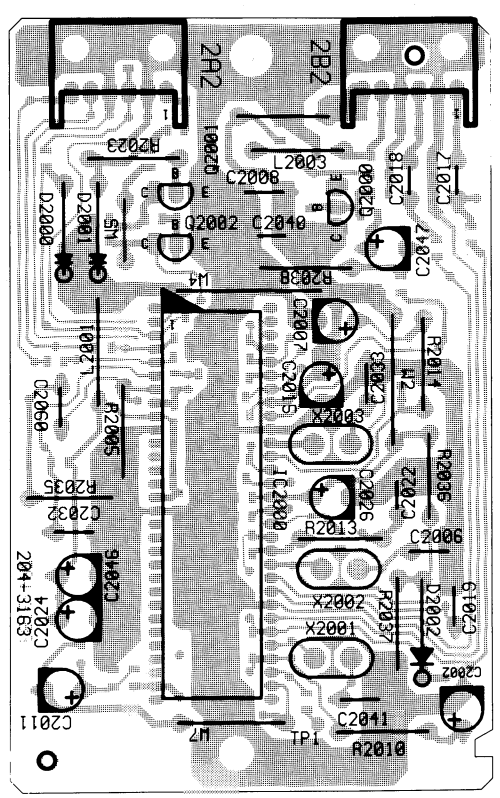


MAIN MODULE COMPONENT LAYOUT

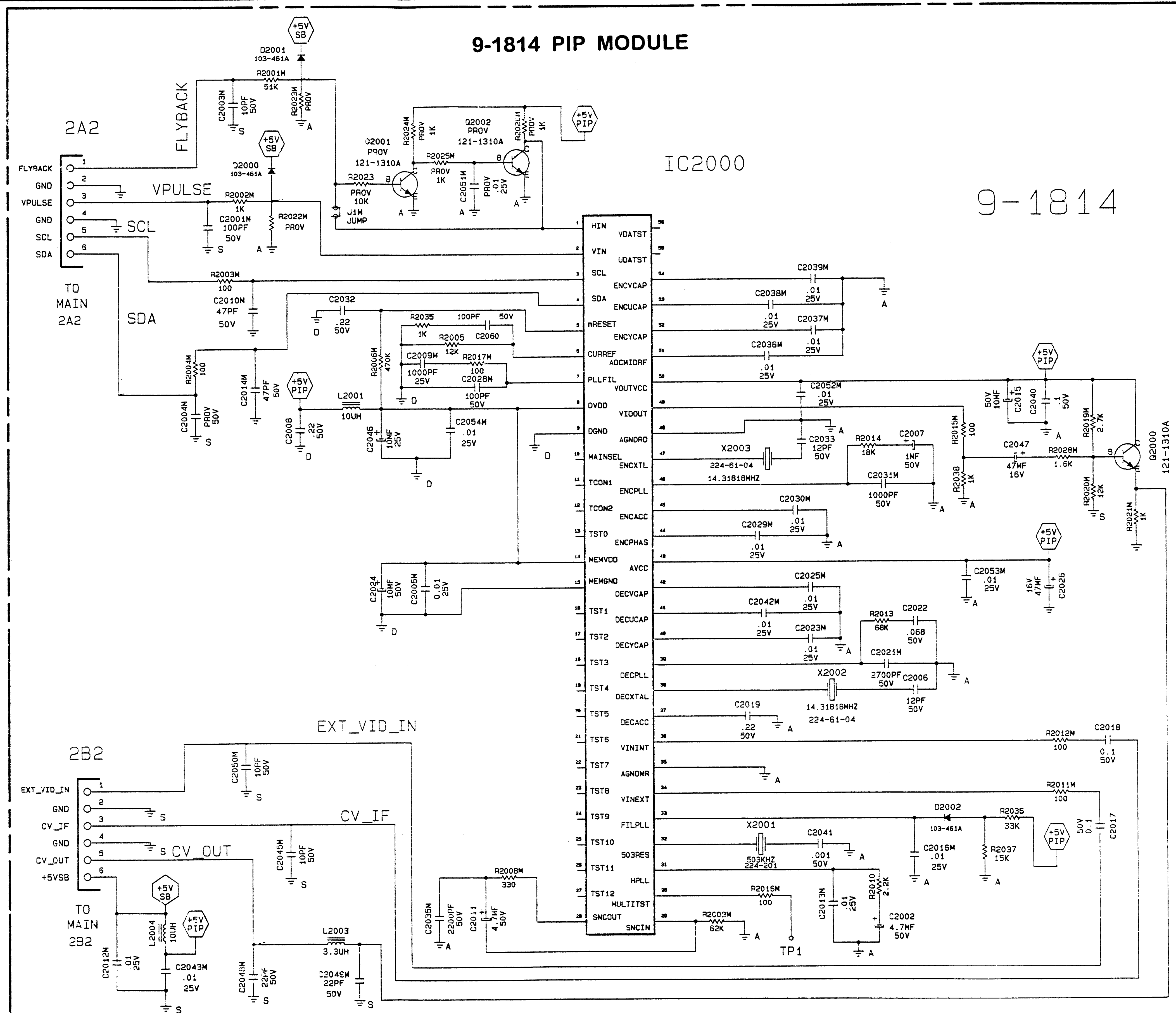


COMPONENT & SMD LAYOUT



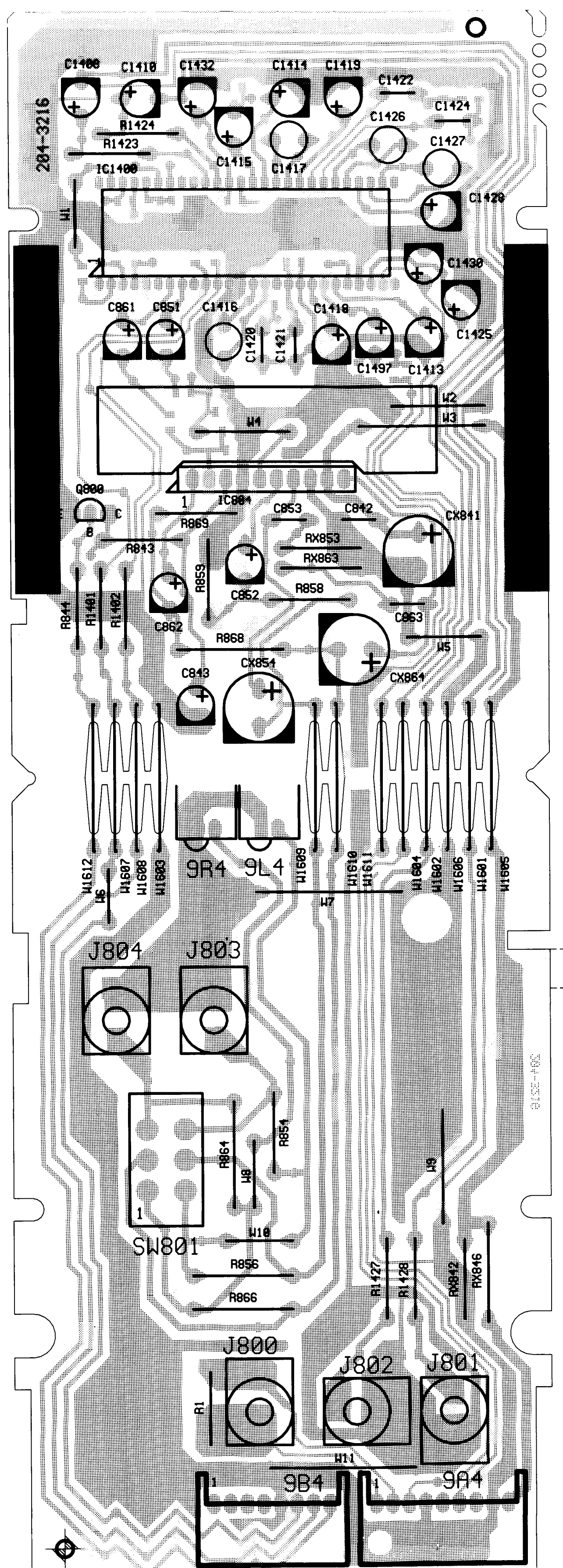


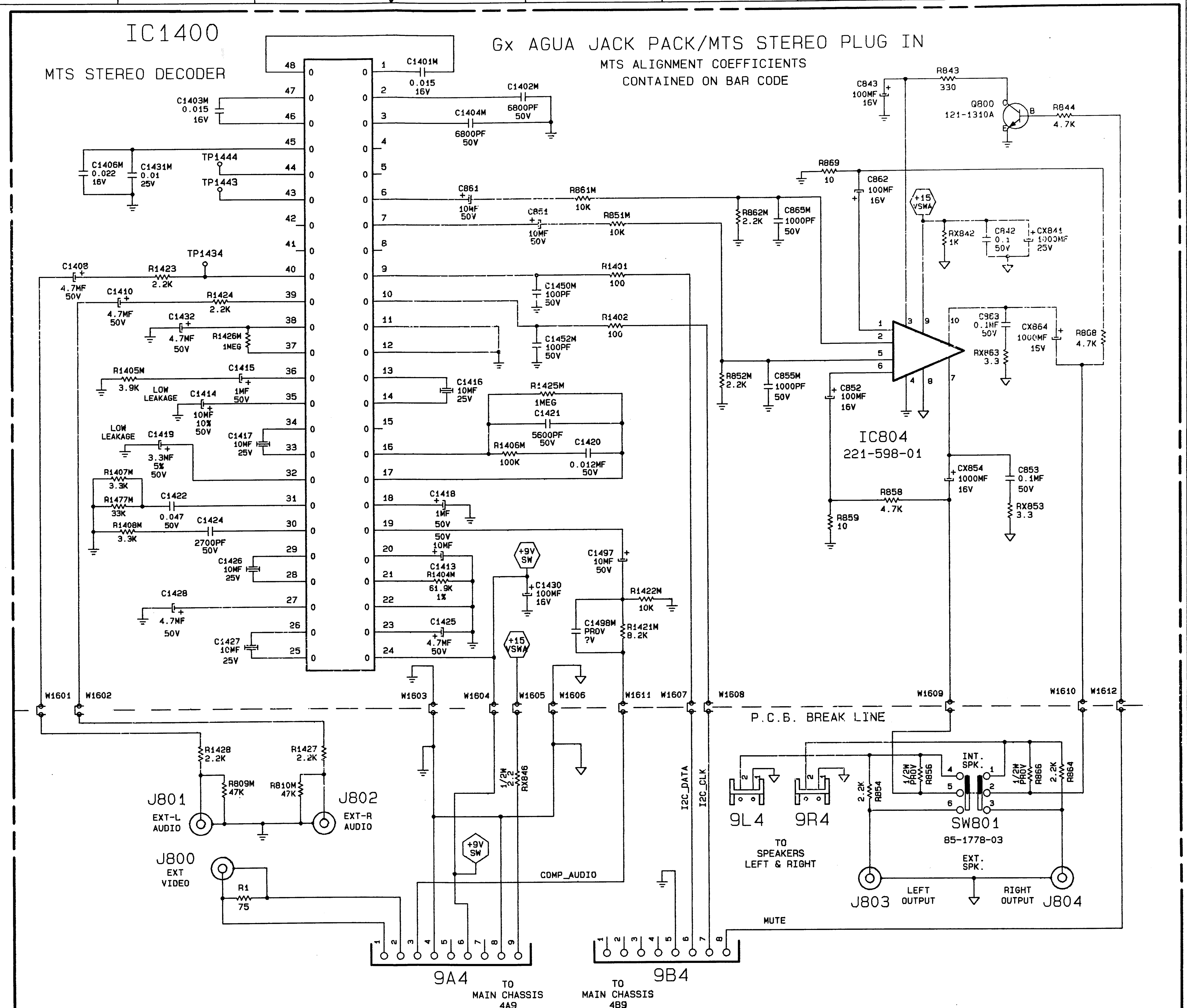
9-1814 PIP MODULE



IMPORTANT SAFETY NOTE: THE COMPONENTS IDENTIFIED BY THE LETTER X IN ITS COMPONENT DESIGNATOR ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

ALL SYMBOLS WITH M ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT.

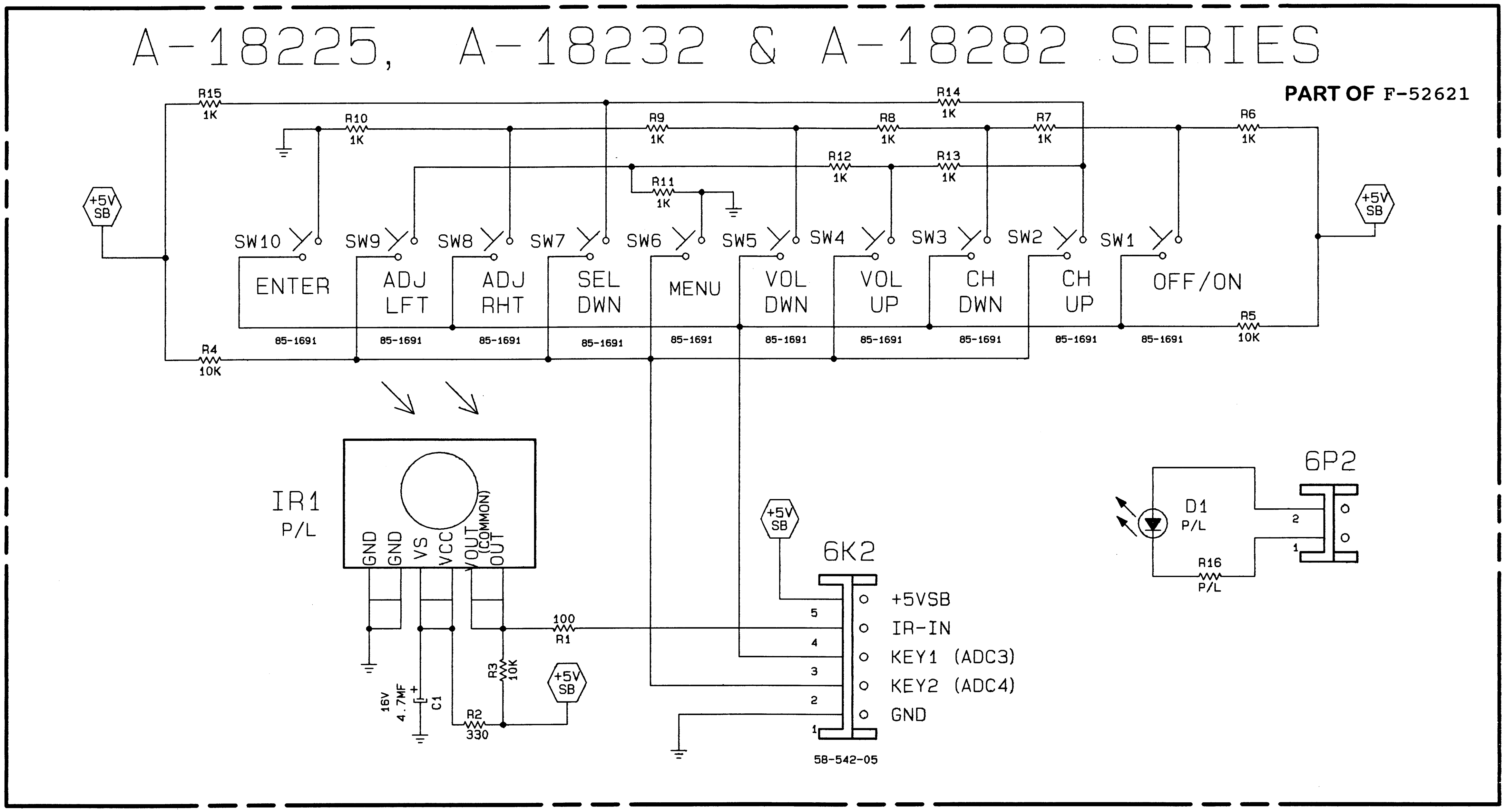


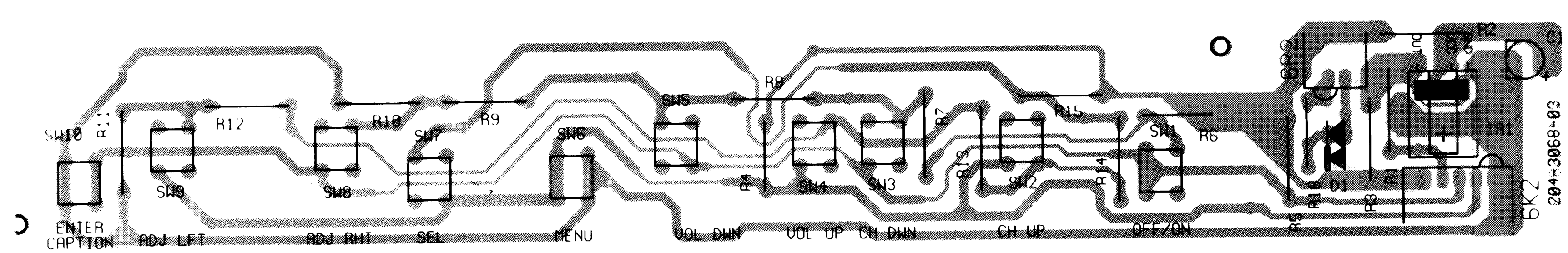


IMPORTANT SAFETY NOTE: THE COMPONENTS IDENTIFIED BY THE LETTER X IN ITS COMPONENT DESIGNATOR ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

ALL SYMBOLS WITH M ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT.

KEYBOARD SCHEMATIC & COMPONENT LAYOUT, REFER TO MODEL PARTS LIST.

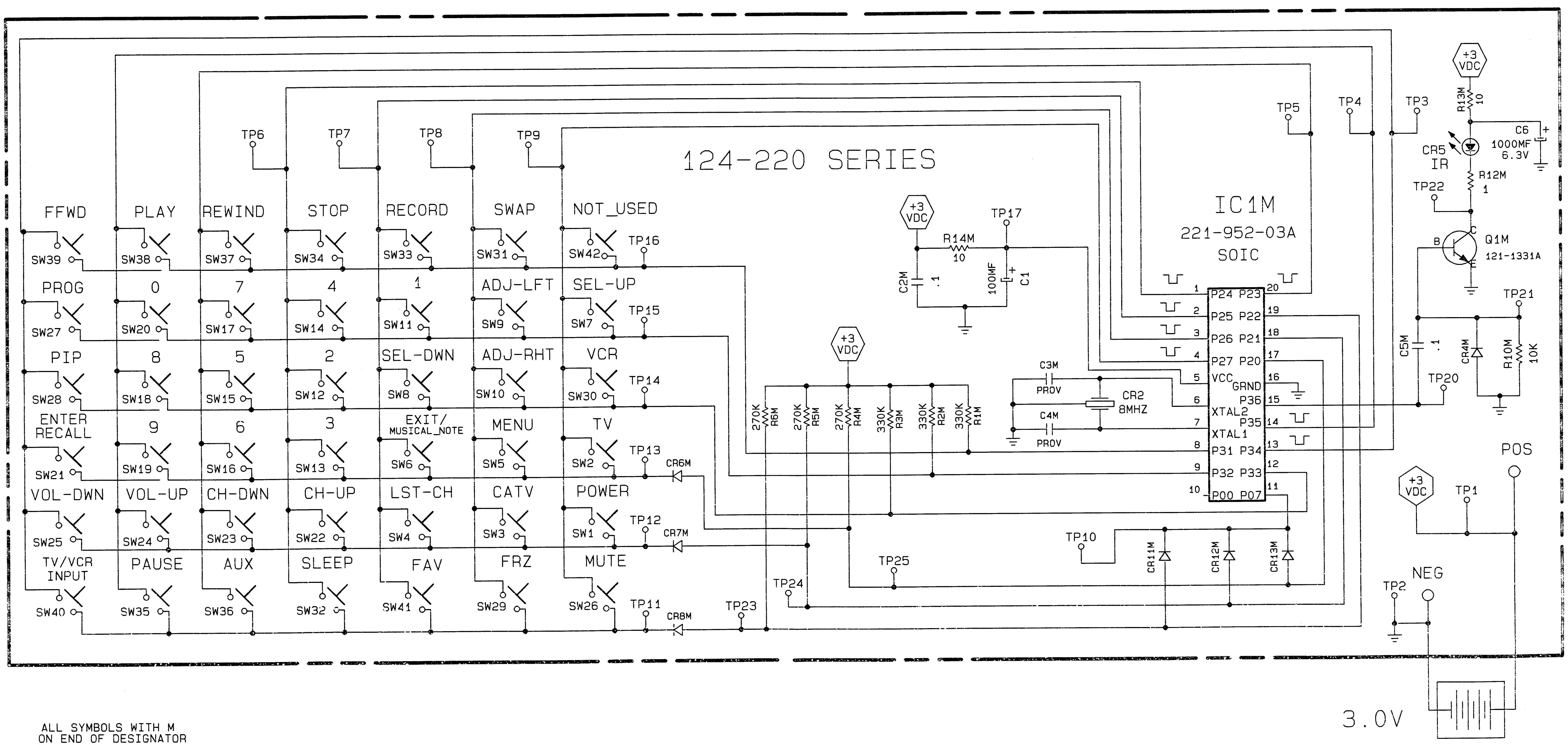




NOTE: NO CARBON LEADS ARE PERMITTED IN THE IR OUTPUT STAGE OR IN THE OSCILLATOR CIRCUIT OR EITHER THE B+ OR GROUND LEADS.

HITACHI MODEL IS CLU-4110U FOR NON-PIP VERSION (PIP, SWAP, FRZ BUTTONS ARE REMOVED)

HITACHI MODEL IS CLU-418U2 FOR THE PIP VERSION



ALL SYMBOLS WITH M ON END OF DESIGNATOR INDICATE SURFACE MOUNTED COMPONENT.

TUNER 175-2700 / 175-2701 / 175-2707

